

# Choice in politics: Equivalency framing in economic policy decisions and the influence of expertise

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## Abstract

Political decision-making involves the presentation of policy options from opposing points of view and in different lights. We test whether economic policy decisions are subject to equivalency framing by presenting survey participants with binary risky-choice decisions in hypothetical policy scenarios. Potentially mediating influences of expertise on the framing effect are explored using responses of students and professionals. Expertise is thereby defined in line with common education and work experience criteria in the recruitment of public officials. We mostly find unidirectional framing effects in the economic policy scenarios and a similar susceptibility of respondents with different levels of expertise. A logistic regression of the expertise variables on the choice between certain and risky options reveals only the frame to have a systematically significant effect across scenarios. The results indicate that expertise may not necessarily help to make better policy choices under risk, if the available options are framed differently.

*JEL classifications:* D73; D81

*Keywords:* Equivalency framing; Political decision-making; Economic policy; Expertise

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## 1. Introduction

Political decision-making is inherently based on the convictions of individual actors and their choices. Voters choose which topics they consider important and whom to elect as their representatives; politicians choose between alternative policy options and how to react to external events; and public officials again have to make various choices when providing the operational and informational base of the policy-making process. The nature of policy-making and the indeterminateness of the future thereby dictate that many of these choices involve risk. Yet, the actors on the institutional side are expected to be able to consistently find the best policy options. In democracies the public relies on them to take the ‘right’ decisions because they are seen as expert decision-makers. Their education, experience, and access to information give them advantages in their subject areas and in the mechanics of politics (Boswell, 2008; Radaelli, 1999; Strøm, 2000).

This expectation raises two issues: First, it is not always clear what determines expertise and its influence on the suitability and capacity of political actors (Bendor, 2010; Emler and Frazer, 1999; Krosnick, 1990). Second, a long line of empirical research on decision-making has shown that human choices are more susceptible to behavioural influences than the popular rational choice theories in political science allow for. In risky-choice, already small linguistic variations in the presentation of equivalent options can alter decision outcomes (Tversky and Kahneman, 1981; Levin et al., 2002; see Kühberger, 1998 for a meta-analysis).

In this paper, we ask whether policy-decisions are subject to framing effects, which direction these effects take, and whether expertise has an influence. Our research is built on Tversky and Kahneman’s (1981, p.453)

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Asian Disease Experiment (ADE), which demonstrates that framing can have a large effect. As a baseline, the ADE itself is reproduced and we find a similar bidirectional effect as the original study. Because of its relevance to a broad range of political decisions we also reproduce Quattrone and Tversky's (1988, p.727) Employment-Inflation trade-off. While it does not feature any risky choices, it is one of the few questions so far to specifically test economic policy scenarios for framing effects. Contrary to Quattrone and Tversky (1988), we do not find a significant effect.

To test framing in economic policy-decisions, we use relevant hypothetical scenarios building on the same structure as the ADE. A sample of students and professionals is presented with salient issues in (EU) policy-making. Participants make a binary choice between a risky and a certain option with equivalent outcomes, in either a positive or a negative frame. Our results show mostly unidirectional framing effects. In the positive frames of our three scenarios, a significant majority prefers the certain option. This picture changes in the negative frame: In two scenarios no option is systematically preferred; and in the third scenario the participants exhibit a weak preference reversal with a smaller majority choosing the risky option.

To explore the potential influence of expertise on the susceptibility to framing, we focus on the criteria used for the recruitment and evaluation of public officials. To our knowledge, no such attempt has been made yet. Using logistic regression models, we test the effects of education, experience, and other control variables on the observed choice behaviour. We find that respondents with high qualification levels and those without show a similar susceptibility, while the frame is the only variable that is systematically significant across scenarios. The presented results call for caution when assuming that expertise helps people to make better policy decisions under risk, if the available options can be framed differently.

## 2. Literature

Decision-modelling and prediction in economics and political science are traditionally based on rational choice theories, such as Expected Utility Theory (EUT) as proposed by von Neumann and Morgenstern (1947). In economics, behavioural approaches have steadily advanced during the last decades and provide an increasingly popular alternative to rational choice approaches. Empirical evidence of decision-biases is well documented in a large literature and is part of the mainstream discourse (Kahneman and Tversky, 2000). Also political scientists criticise the failure of rational choice theories to explain empirical data in decision-making, a tendency to post-hoc theorising (Green and Shapiro, 1994), and the failure of their mostly deductive methods to capture the complexities of human decision-making (Simon, 1995).<sup>1</sup> Nonetheless, rational choice still seems to be the preferred tool-kit and dominating paradigm in political science (Peters, 2005; Pollack, 2006). As Schnellenbach and Schubert (2014) point out, the behavioural approach is also only slowly entering the realms of public choice and political economy.

The gradual evolution of behavioural choice concepts has caused much debate about the normative and descriptive adequacy of the axioms of rational choice theory. Two of its key assumptions are invariance and dominance. Invariance dictates that preferences should be independent of the description of the options, as long as the content is not changed. Dominance requires an option to be preferred over all other options, as long as it is better in one state and at least as good in all other states. The representation, or framing, of options given in a problem should thus not have any impact on choice if their outcomes are equivalent. Tversky and Kahneman (1981, 1986) specifically challenge these two axioms after finding numerous deviations from the predictions of rational choice theories throughout different experiments.

In their well-known Asian Disease Experiment (ADE), participants are told that a rare disease is threatening lives and that they need to choose one of two available response programmes. One option provides a certain outcome, whereas the other option carries risk by offering two possible outcomes and their respective probabilities. Both options are mathematically equivalent, but participants receive them either framed negatively or positively. In the negative frame, the outcome is described by how many people will die if either programme is chosen, and in the positive frame by how many people will survive. In the original

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<sup>1</sup>However, the available behavioural accounts (e.g. Bounded Rationality) usually face their own problems, such as aggregation and dynamics (see Harstad and Selten, this issue).

study, participants chose the risky option when the outcome is framed in terms of ‘deaths’, and the risk-free option when the outcome is framed in terms of ‘lives saved’ (Tversky and Kahneman, 1981).<sup>2</sup>

To integrate framing effects and other violations of EUT’s axioms, Kahneman and Tversky (1979) developed Prospect Theory as their descriptive model of decision-making under risk. It builds on the notion that decision-makers assess options with respect to a subjective reference point, reacting differently to gains and losses: individuals are risk-averse in the domain of gains and risk-seeking in the domain of losses (reflection effect). Losses also hurt more than gains gratify (loss aversion).<sup>3</sup>

In the political context, the importance of framing in decision-making under risk received increased attention when (mostly) international relations researchers started to apply Prospect Theory to explain the behaviour of governments and individual leaders in crisis situations (see Boettcher, 2004; McDermott, 2004; Mercer, 2005, for reviews). Currently ongoing work expands these efforts by testing Prospect Theory’s predictions with Members of Parliament from various countries and promises interesting results (Linde and Vis, 2014; Loewen et al., 2014).

Mercer (2005) suggests that a political actor will commonly see the status-quo as reference point.<sup>4</sup> In this paper we take the same approach as Tversky and Kahneman (1981) and assume that the reference point and the domains of gain and loss are induced by the scenario description. In more dynamic situations, the domain an actor sees himself in, would, however, depend to a larger extent on deviations from a pre-existing or current context. Especially in crisis situations, when most decisions carry risk, an actor’s perceived domain has the potential to distort his actions. If, for example, the state of a military campaign is perceived as a loss (be it personnel, strategic influence, reputation, etc.), the propensity to take risks to mitigate the situation increases (Levy, 1997; Mercer, 2005). When a policy creates benefits that are also perceived as gains, the willingness to take risks to achieve even better results diminishes (McDermott, 2004).

A political actor could also have a constructed goal, or an aspiration, as a reference point rather than the status-quo. The actor may envision a specific target result against which reality is then compared. For instance, the aim of an economic policy reform might be a drop in the unemployment rate from ten percent to eight percent. A politician basing his next election campaign on achieving this reduction effectively takes the not yet realised eight percent as reference point. As the reference point is ‘better’ than the current state, the current state is perceived as a loss. The actor is motivated to take more risk to avoid this ‘loss’ and disrupt the status-quo (Levy, 2003).

### 3. Hypotheses

Equivalency framing effects have been confirmed in a large range of studies with diverse alterations to the experimental settings (e.g. Bless et al., 1998; Druckman, 2001; Kühberger, 1998; Kühberger et al., 1999).<sup>5</sup> Frisch (1993) even finds that the effect holds for participants who, on reflection, agree that the two options should be treated the same. This finding refutes attempts to explain the framing effect by errors based on misinterpretations of single options. The common criticism that results obtained under laboratory-like conditions are not applicable to real-world situations (Levy, 1997), is, for example, answered by Büttler and Maréchal’s (2007) confirmation of equivalency framing effects in a large scale natural experiment in a Swiss policy referendum. The hypothetical nature of outcomes in framing questions does not necessarily prohibit the generalisation of results to real world applications (Wiseman and Levin, 1996). However, the occurrence of framing effects in ADE-like questions has been found to depend on the task domain (Kühberger et al., 1999; Rönnlund et al., 2005; Wang, 1996). While some studies replicating the ADE have used employment

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<sup>2</sup>See Appendix A for a reproduction of the Asian Disease Experiment.

<sup>3</sup>McDermott (1998) provides an in-depth description of Prospect Theory in the political context.

<sup>4</sup>Equating the status-quo with the reference point seems to be a widely used method for considerations of Prospect Theory in international relations (McDermott, 1998; Mercer, 2005). It also lends itself as easily operationalisable and sensible approach for political decision-making. However, the definition of reference points is highly debated and includes, for example, arguments such as: multiple reference points (Kahneman, 1992; McDermott, 1998), endogeneity (Kőszegi and Rabin, 2006, 2007), and the certainty equivalence (Meza and Webb, 2007) and uncertainty of reference points (Schmidt et al., 2008).

<sup>5</sup>The same cannot necessarily be said of other biases, see, for example, Henrich et al. (2010).

numbers (e.g. Bazerman, 1984), research on equivalency framing in other economic policy scenarios is rare. Given the broad confirmation from other domains, we expect economic policy scenarios in general to be subject to framing effects. Our first hypothesis, therefore, is that framing effects as such also occur in ADE-like questions with economic policy scenarios.

*Hypothesis 1: Equivalency framing effects occur in binary economic policy decision problems with differently risky options.*

The risk a political actor chooses to take in a policy decision is largely borne by the population. The actor's distance to the direct consequences could potentially lead to a lower weighting of risk. Politicians, of course, face indirect consequences such as electoral approval, and public officials are subject to supervision and scrutiny. Nonetheless, the repercussions of single decisions are typically weaker and delayed by nature. In a loss situation, the appeal of taking a risky gamble could either be expected to increase or to decrease. On the one hand, the risky gamble offers the chance to minimise any own loss the decision-maker may perceive (e.g. reputation). In addition, the consequences of loosing the gamble do not directly concern the decision-maker, but are borne by others. On the other hand, with enough distance, it may be easier to accept a small loss with certainty than to strain someone else's luck. In a gain situation the choice to take or refuse the gamble can also be motivated differently. Either it can be seen as easier to accept the certain gain without having to strive for a better outcome to the benefit of others, or both options are seen as a relative gain anyway. If the difference between the gains is not perceived as substantial, the gamble may be played just as well. In extension, it could be argued that the frames should become less relevant with increasing distance and the observed choice behaviour should get closer to the predictions of rational choice. The consistent finding of equivalency framing effects in scenarios with public goods (Wang, 1996), jobs (Bazerman, 1984), property, social equality (Kühberger et al., 1999), and lives at stake indicates, however, that distance to personal consequences does not automatically render frames ineffective. The direction of their effects does shift though.

In replications of the classic life-death scenario, bidirectional framing effects are consistently found (Druckman, 2001; Kühberger, 1998; Wang, 1996). A bidirectional effect implies that participants reverse their preferences depending on the frame: in line with Prospect Theory, the majority would choose the certain option in the positive frame and the risky option in the negative frame. In other scenarios such as personal property (e.g. money) or public property (e.g. paintings in a museum) unidirectional effects appear to dominate: respondents lean towards either the certain or the risky option in both frames, but in one more so than in the other; the majority for the favoured option becomes larger (Wang, 1996). For example, a shift from 60 percent favouring the risky option in the positive frame to 80 percent favouring the risky option in the negative frame would constitute a unidirectional effect.

Wang (1996) explains the difference in risk-seeking behaviour between different domains with participants' changing aspiration levels. Saving lives is more important to people than money and creates higher minimum requirements that decision-makers want to see fulfilled, causing them to accept different levels of risk. Due to the more material nature of the task domain, we would not expect economic policy to create the same aspiration levels as a life-death scenario. A natural intuition would be that potential effects in economic policy decisions could be similar to those observed in the public property scenario. The aspiration level is less dependent on emotional attachment than in a life-death scenario and the distance to the outcome is large in both domains. In public property scenarios, decision-makers tend to be indifferent between the risky and certain option in the negative frame, but risk-averse in the positive frame. It is easier to accept a certain gain than to take a risk to reach an outcome that is already above one's aspiration level. In our survey, we would thus expect to find a bidirectional effect for the replication of the ADE (life-death scenario) and unidirectional effects for the hypothetical economic policy questions.

*Hypothesis 2: Framing effects in economic policy scenarios are unidirectional.*

In political debates expertise plays an increasingly important role (Rayner, 2003). Politicians can hope for more support from their constituencies if they are perceived as experts in the policy field in which they are active. In parliamentary and administrative committees, internal and external experts are asked for

their evaluations of new proposals and policies (Radaelli, 1999). Public officials are also expected to have a form of general expertise through their qualifications and experience (Boswell, 2008).<sup>6</sup> Experts are not only passive receivers, but can actively shape the way policy options are framed (Afonso, 2007). Nullmeier (2005), for example, observes that external experts, such as academics, not only carry their empirical and normative knowledge into the policy-making process when asked for their opinion, but also their vocabulary and conceptual tools. The imported language in turn, shapes the proposals considered by decision-makers. The contrast of different expert opinions for a proposal may be one source of competing frames.

Fiske et al. (1983) argue that experts enjoy cognitive advantages for problem-solving within their respective fields. They have more information about their task environment and possible action strategies stored in long-term memory. The available short-term memory capacity is better utilised as existing knowledge is organised more efficiently and single pieces are well connected. The problem spaces (mental representations of the environment and content of decision tasks) which they build to process relevant information are more complex and include more relevant up-front considerations. Lastly, experts have domain-specific heuristics at their command for issues in their field, whereas non-experts do not. As an example, think of a political actor facing the highly risky decision whether to support the bail-out of a large, system-relevant bank during a crisis. He or she would be under immense time pressure, as one could also observe in reality at the start of the financial crisis. Yet, it is a fair assumption that a systematic analysis of the available information would at least be attempted. By contrast, a routine problem with far less potentially catastrophic consequences (e.g. agenda setting, permission granting, procedural decisions, etc.) could be perceived as too mundane to trigger the effort of full conscious processing. The role of supporting staff in organising information for political actors further decreases the need for mental work. If the problem is perceived as unimportant, or ranking lower than more pressing issues, heuristics become more important. The tendency to act ‘from the gut’ may arise even more for experienced actors (Kahneman, 2003).<sup>7</sup> Heuristics can, however, lead to mistakes such as representativeness, availability, confirmation, and anchoring biases. These biases can become particularly troublesome when they influence judgement about the options which underlie a decision. With regard to framing, it is unclear how influential these cognitive characteristics actually are. McDermott (1998), for example, argues that the cognitive capacities of experts are not different enough from those of novices to influence their reactions to framing.

Based on a meta-analysis of 136 framing studies, Kühberger (1998) suggests, that experts are susceptible to framing, but may be less so than the student samples used in most framing studies. Who qualifies as an expert is not fully defined and different studies look at various potential indicators. In the framing literature aspects such as risk orientations (Kam and Simas, 2010), (in)numeracy (Lawrence, 2010; Peters et al., 2006; Peters and Levin, 2008), and need-for-cognition (Druckman, 2001; LeBoeuf and Shafir, 2003) have been discussed. Popular measures in the reality of the recruitment of officials, however, focus more on the interest in political affairs, experience, and education (e.g. European Commission, 2012b).

As the evidence presented in the literature points in different directions, we are not confident in making any predictions whether experts will be more or less susceptible to framing than novices in our hypothetical economic policy scenarios. The theoretic foundations of experts’ cognitive capacities do not seem to be well enough reflected in empirical findings to draw clear conclusions for our research. The literature on expertise and framing uses measures that do not necessarily capture the reality of the selection of people into expert roles. We therefore pose the following research question:

*Research Question 3: Does expertise reduce equivalency framing effects in economic policy decisions?*

Economic policy covers a very extensive field. The design of social welfare systems requires, for example, other knowledge and considerations than the regulation of the banking sector. The specific knowledge of the

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<sup>6</sup>See Christensen (2015) for a discussion of the different aspects of expert- and generalist-skill based staff selection in large bureaucracies on the example of the European Commission.

<sup>7</sup>The use of intuition rather than conscious and effortful reasoning need not necessarily result in poor performance. As Kahneman (2003) points out, using examples of master chess players and experienced nurses, intuition can be ‘powerful and accurate’.

subject, the decision-maker’s ideology and beliefs (Kahan et al., 2013), and the experience from previous encounters of similar situations (List, 2004) are just a few factors that might influence the responsiveness to risk and frames. The considerations undertaken in different policy areas are not likely to be consistently shaped by the same characteristics of respondents. Even if experts are significantly less susceptible to framing effects than novices, we would not expect the indicators to play a consistent role across problem scenarios. In a purely explorative advance, and without making any predictions, we look at the significance of demographic and expertise variables in determining the choice between the risky and the risk-less option in different economic policy decision-problems.

*Research Question 4: Which indicators of expertise have an influence on the choice between risky and risk-less options in economic policy decisions?*

#### 4. Design

We use Tversky and Kahneman’s (1981) ADE and three re-phrasings with economic policy scenarios to test our hypotheses and answer our research questions. Like the ADE, our own scenarios present participants with the choice between one certain and one risky option. The certain option offers a fixed outcome, while the risky option contains two possible outcomes and their respective probabilities. The outcome-sizes provided in the options are chosen to match the scenarios. The probabilities are of moderate size to avoid discrepancies in their weighting and to match the conditions of the original ADE. Questions are presented in either a positive or a negative frame with altered linguistic descriptions and mathematically equivalent outcomes across and within frames. The topics cover a range of economic policies that are common enough in the public discourse and the media for participants to be aware of. The complete question texts can be found in Appendix B.

- The Bailout scenario offers participants two different ways to distribute six billion Euro needed as financial aid to an EU member state. One option offers the repayment/loss of a fixed amount, and the second option offers two respective probabilities to get either the full amount back or nothing.
- The Trade agreement scenario asks participants to choose between different forms of agreements regulating the import of materials needed by industry. The options provide either a guaranteed or a variable level of resource availability and resulting industry turnover based on the type of agreement. The turnover is given as a positive number in the positive frame and as a shortfall to maximum capacity in the negative frame.
- The Employment scenario deals with the liberalisation of an unnamed industry with consequences for jobs. One option includes the loss/saving of a fixed share of jobs, and the other option two respective probabilities of losing/saving either all or no jobs.

To evaluate any framing effects against the expertise level of the decision-makers, we collect information on the demographics of our sample, and on the education, work experience, and interest in relevant subject areas of our participants. These items are used as independent variables to assess the influence of expertise on the susceptibility to framing.

##### 4.1. Procedures

Our questions were incorporated in a larger political decision-making survey administered online. All questions were tested for comprehensibility and structure in a small paper-based pilot ( $n = 20$ ) before inclusion. The survey embedded the questions in a European Union context to make the policy issues more accessible for participants and create a realistic backdrop for the questions with hypothetical scenarios. To match this set-up, the ADE is reproduced with a minor change of the scenario description from “... in the US ...” to “... in the EU ...”.

The survey was advertised to political science and economics students at a few European universities<sup>8</sup>, spread within the European institutions through personal contacts of the authors, and posted on social media during spring 2012. After completion of the survey, participation in a random draw lottery to win a 20 Euro book voucher is available. We do not offer any individual incentives linked to the participants' choices. Each participant receives each question in one of the two frames and in a randomised order. Always one of the two offered options needs to be selected, with no possibility to express indifference.<sup>9</sup> Individual questions cannot be avoided without terminating participation in the survey. Participants are assigned to one of four different conditions containing the possible permutations of the frames.<sup>10</sup>

## 5. Results

One hundred and twenty-seven participants ( $N = 127$ ) answered the complete survey. Tests of normality revealed that *age* (in years) and indicators of expertise (*years of study*, *years of work*, *interest in Economics / Politics / EU politics*, and *attitude* towards the EU) are non-normally distributed (Shapiro-Wilk test:  $p < 0.01$  for all variables). Consequently, non-parametric test statistics are used where necessary.

### 5.1. Demographics

The demographics of our sample are summarised in Panel A of Table 1. Most framing experiments typically use student samples. With the inclusion of professionals as a core feature of this survey, the age distribution is wider than usual. It ranges from 18 to 54 years of age (median = 25). Sixteen percent of respondents completed secondary education, 31 percent obtained a Bachelor's degree, and 41 percent a Master's degree. Six percent have finished their PhD. Because the required number of years can differ for degrees with similar titles across educational systems, *years of study* at university level is a more reliable indicator of education. The median respondent spent five years on post-secondary education.

Of the 127 participants, 81 (64 percent) have professional experience with between one and 29 *years of work* (median = 3.00). The three largest job groups are academics, economic analysts, and consultants, together comprising 36 percent of professionals in our sample. Just over six percent are public officials. Although we are looking at framing in political decision-making, the number of actual officials in our sample is not decisive. We are interested in the attribution of the capacity to perform better in a task than others. In the political work environment, this attribution is initially often based on education and work experience. Participants were therefore asked to indicate the fields of study and work experience they thought would best qualify someone to solve the problems presented in the survey. Participants could choose up to three professional areas from a list or provide their own answers.

**Table 1:** Sample demographics (Panel A) and professions ranked by participants as most qualified to solve the presented hypothetical economic policy problems (Panel B).

A) Sample Demographics				B) Top-5 of Participants' Ranking of relevant Professions	
Female	61	percent		1.	Economic Analysis
Age (median)	25	years		2.	Public Administration (EU)
Years of Study (median)	5	years		3.	Finance
Work Experience	64	percent		4.	Academia
Highly Relevant Work Experience (top 3 in Panel B)	22	percent		5.	Public Administration (national)

<sup>8</sup>Vrije Universiteit Brussel, Belgium, Université Libre de Bruxelles, Belgium, Technische Universität München, Germany, Uppsala University, Sweden.

<sup>9</sup>See Fagley and Miller (1987) for a study that includes an indifference option. Policy-decisions are very unlikely to leave the decision-maker the option to express indifference or decline choosing. The omission of this possibility therefore seems acceptable.

<sup>10</sup>Always two conditions received the positive frame of a question and the other two received the negative frame. The responses were subsequently collapsed dependent on the administered frame. Due to an error in the assignment to the different permutation conditions the respondents were not split in groups of equal size. In the most unequal distribution 40 valid responses are in one frame and 87 in the other. The randomisation of the questions was not influenced.

Economic analysts lead the ranking as shown in Panel B of Table 1, followed by public officials, and financial sector workers. As public officials and politicians are expected to be able to make the ‘right’ decisions and our sample contains a fair share of participants judged to have the same quality, we feel confident in transferring our findings from our ‘experts’ to the political reality.

Sixty-one percent of the sample are female and 39 percent male.<sup>11</sup> Using non-parametric Levene’s tests (Nordstokke et al., 2011), we find no significant differences among men and women for the distributions of age and the above listed expertise variables. In studies on behaviour under risk, men are repeatedly found to be more risk-seeking than women (Byrnes et al., 1999).<sup>12</sup> For framing effects the literature is less clear. When analysing the predisposition of women and men to framing Fagley and Miller (1990) and Frisch (1993) find women to be more likely to exhibit a framing effect, while Druckman (2001) finds women not to be more susceptible than men in the ADE.

### 5.2. Framing effects in the ADE and in economic policy scenarios

Table 2 provides an overview of the choices our participants made. Like Wang (1996), we take the assumption that risk-neutrality in a between-subject design would lead to a distribution of roughly 50–50 between the risky and certain options as an operational estimate of the risk-neutral reference point. In their original version of the ADE, Tversky and Kahneman (1981) found 72 percent of respondents to prefer the certain option in the positive frame, but only 22 percent in the negative frame. Our reproduction shows similar bidirectional effects. Sixty-two and 30 percent of our respondents prefer the certain option in the positive and negative frame, respectively. In line with the predictions of Prospect Theory, the certain option is preferred in the positive frame and the risky option in the negative frame. The slightly smaller effect size in our sample may be a result of the question’s increased publicity.

**Table 2:** Answers of all respondents to the reproduction of the Asian Disease Experiment and to our own scenarios. Results are split by frame and given in percentages.

Choice	ADE		Bailout		Trade		Employment	
	P	N	P	N	P	N	P	N
Certain	62**	30***	75***	35*	70***	51	78***	52
Risky	38**	70***	25***	65*	30***	49	22***	48
Total	100	100	100	100	100	100	100	100

Notes: P = positive frame, N = negative frame; p-values for  $\chi^2$  goodness-of-fit scores for equal distributions: \* $p < .10$ , \*\* $p < .05$ , \*\*\* $p < .01$ .

In all three economic policy questions respondents prefer the certain option in the positive frame, with 75, 70, and 78 percent, respectively. These results near-perfectly match the outcome in the positive frame of Tversky and Kahneman’s (1981) ADE. The preference for the certain option again corresponds with Prospect Theory’s prediction of risk-aversion for gain domains. We use chi-square goodness-of-fit tests for equal distributions ( $\chi^2$ ) throughout the rest of this section to evaluate the significance of the framing effect. The choices in the positive frames of all three scenarios are significantly different from the operationalised risk-neutral outcome at the one percent level, clearly indicating risk-aversion. In the negative frame of the Bailout scenario, 35 percent of respondents prefer the certain option and 65 percent the risky option.

<sup>11</sup>Most career politicians are still male. Because we look at a broader definition of political actors and use the recruitment criteria for public officials as our indicators of expertise, the gender distribution in bureaucracies is, however, also relevant. Take the example of the European Institutions again. The number of women has consistently been rising during the last decades. By now, 59 percent of the institutional staff in the European Parliament are female. In the Commission around 52 percent of the total staff are women. While there still is an imbalance for management positions, some Directorate-Generals (DGs) are closer to equality. In DG Justice, for example, senior management is 50 percent and middle-management 55 percent female (European Commission, 2012a; European Parliament, 2014).

<sup>12</sup>Examples include financial decision-making (Fellner and Maciejovsky, 2007; Powell and Ansic, 1997) and gambling settings (Eckel and Grossman, 2008; Levin et al., 1988).

Respondents thus reversed their preference portraying risk-seeking behaviour ( $\chi^2 = 3.60, df = 1, p < .10$ ). In the Trade ( $\chi^2 = .00, df = 1, p > .10$ ) and Employment ( $\chi^2 = .10, df = 1, p > .10$ ) scenarios the responses in the negative frame are not significantly different from a 50–50 distribution. Fifty-one and 52 percent prefer the certain options, and 49 and 48 percent the risky options, respectively. These results provide support for our prediction in Hypothesis 1 that framing effects occur in economic policy scenarios.

The results for the Trade and Employment scenarios are in line with our Hypothesis 2, that framing effects in economic policy scenarios are unidirectional. The Bailout scenario, however, contradicts this prediction. While the low level of significance in the negative frame calls for some caution, the preference reversal in this scenario does not allow us to universally categorise the framing effects in our economic policy scenarios as unidirectional.

### 5.3. The employment-inflation trade-off

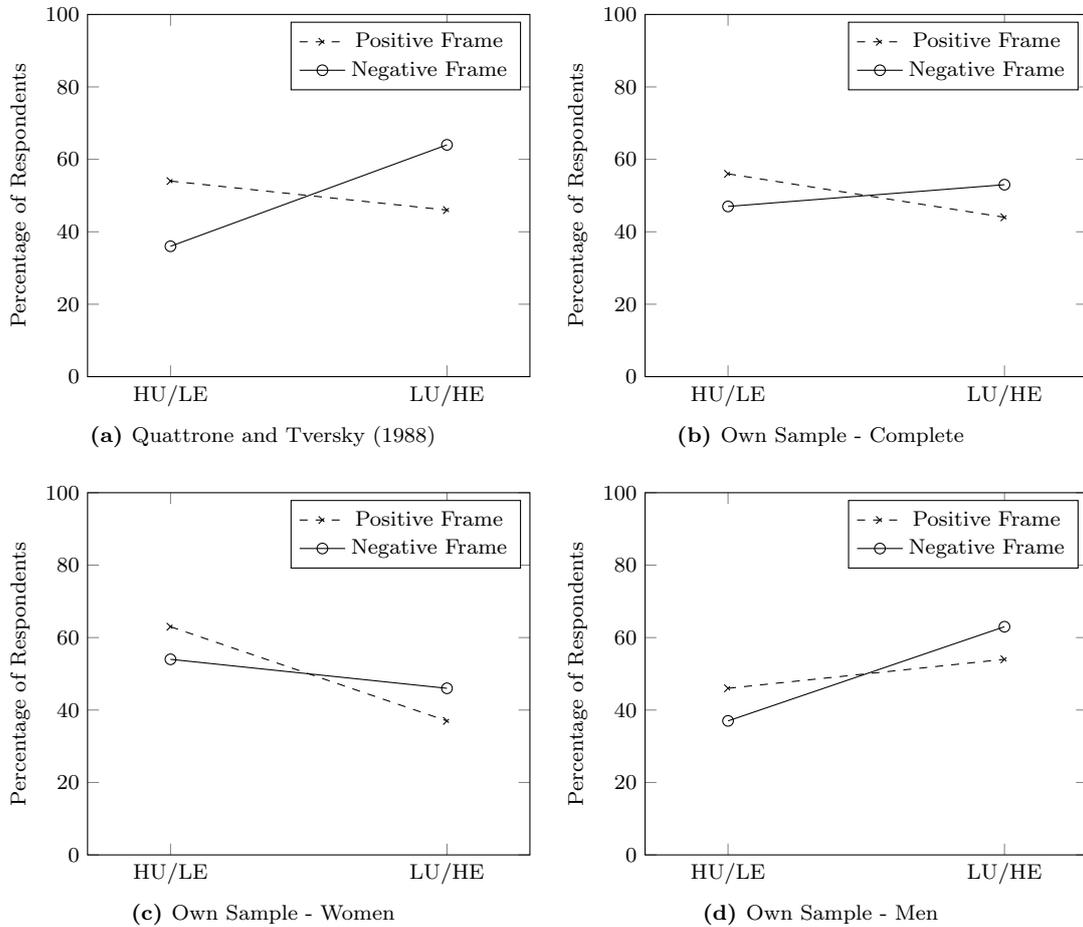
In addition to the ADE-based scenarios, we include an unaltered reproduction of Quattrone and Tversky’s (1988) Inflation-Employment trade-off in our survey. This question differs from the ADE design. It does not consider risky-choice, but tests the influence of the ratio of two equivalent changes from different starting points expressed in absolute terms. A five unit change from a base of five has a different ratio than a five unit change from a base of 90, but the total change is equivalent. One frame presents a scenario in which respondents have to choose between two options in which they trade off specified levels of inflation against either five or ten percent unemployment. The other frame offers participants the same levels of inflation, but either a 95 or 90 percent employment rate. Under rational choice, the two option sets should have the same value and should result in the same choice outcome across frames. The frames in this scenario further stimulate considerations of positive or negative associations with the unit of measurement in which the outcome is expressed (Levin et al., 2002). A full reproduction of the question is provided in Appendix A. It was included in our survey because of its relevance with respect to political behaviour. Quattrone and Tversky’s (1988) finding of a framing effect for this type of question constitutes a problem for rational choice because the changes are unambiguously equivalent and the experimental findings violate the invariance axiom.

In their original study, Quattrone and Tversky (1988) did not find a significant departure from an equal distribution in the positive frame. Forty-six percent of their participants preferred the option providing higher employment (HE) and 54 percent the option providing lower employment (LE). In the positive frame of our replication we also get numbers close to equal distribution. Higher Employment is favoured by 44 percent, while 56 percent choose LE ( $\chi^2 = 1.39, df = 1, p > .10$ ). Quattrone and Tversky (1988), however, observed a framing effect in the negative frame, where only 36 percent of participants chose the effectively LE and 64 percent chose HE. We could not replicate this result. In our negative frame 53 percent choose HE and 47 percent LE ( $\chi^2 = .10, df = 1, p > .10$ ). Our participants did thus not significantly depart from a 50–50 distribution in either frame.

This lack of sensitivity to the frames is puzzling. Splitting the sample by gender reveals some small departures from equal distributions, but they are in opposite directions for men and women. Only the responses of women in the positive frame are distributed unequally enough to show a marginally significant framing effect ( $\chi^2 = 3.63, df = 1, p < .10$ ). Figure 1 provides a visualisation of the answer patterns of Quattrone and Tversky’s (1988) original study, our complete sample<sup>13</sup>, and men and women separately. While the differences in the choices of men and women are not large to begin with, the contrary choice behaviour, as illustrated by the rotation of the axes in panels c) and d), prevents any framing effect for the complete sample. We find no clear indication why this is the case. The influence of the linguistic description on different sample groups in this scenario seems to be more complex than anticipated and warrants further study. An interesting route to explore in this specific domain may lie in cultural differences and how they shape the perceptions of unemployment and inflation.<sup>14</sup>

<sup>13</sup>Sample sizes are almost identical in our survey ( $N = 127$ ) and in Quattrone and Tversky’s (1988) original study ( $N = 126$ ).

<sup>14</sup>We thank one of our anonymous reviewers for this suggestion.



Notes: HU/LE = High Unemployment/Low Employment, LU/HE = Low Unemployment/High Employment.

**Figure 1:** Response patterns for Quattrone and Tversky's (1988) original version of the Employment-Inflation trade-off (a), the full sample in our reproduction (b), and the sample in our reproduction split by gender (c and d).

#### 5.4. The effect of expertise

As a first step in the evaluation of the influence of expertise, we compare participants with at least five completed years of study at university level<sup>15</sup> and at least some work experience against the rest (46.5 and 53.5 percent of the sample, respectively). The framing effects exhibited by the two groups in the economic policy scenarios are shown in Table 3.

<sup>15</sup>Five years is the normal duration of studies to obtain a Masters degree in many education systems. As an example, 70 percent of the European Commission staff hold a postgraduate degree on such a level or higher (Kassim et al., 2013).

**Table 3:** Comparison of the responses to the three hypothetical economic policy scenarios between participants with high qualification (at least 5 years of study plus work experience) and the rest of the sample in percentages.

	Choice	Bailout		Trade		Employment	
		P	N	P	N	P	N
High Qualification (n = 59)	Certain	77***	25**	77**	41	70*	59
	Risky	23***	75**	23**	59	30*	41
	Total	100	100	100	100	100	100
Other (n = 68)	Certain	73***	45	63	59	85***	46
	Risky	27***	55	37	41	15***	54
	Total	100	100	100	100	100	100

Notes: P = positive frame, N = negative frame; p-values for  $\chi^2$  goodness-of-fit scores for equal distributions: \* $p < .10$ , \*\* $p < .05$ , \*\*\* $p < .01$ ;  $df = 1$ .

- In the Bailout scenario, the highly qualified group shows a significant preference reversal by preferring the certain option in the positive frame ( $\chi^2 = 11.38, df = 1, p < .01$ ), and the risky option in the negative frame ( $\chi^2 = 5.00, df = 1, p < .05$ ). The less qualified group only significantly prefers the certain option in the positive frame ( $\chi^2 = 10.08, df = 1, p < .01$ ).
- In the positive frame of the Trade scenario, the better-qualified group prefers the certain option ( $\chi^2 = 6.55, df = 1, p < .05$ ), while the other group does not show a clear preference ( $\chi^2 = 1.50, df = 1, p > .10$ ). In the negative frame, none of the two groups departs significantly from a 50-50 distribution.
- The results for the Employment scenario show a preference for the certain option of both groups in the positive frame, but not in the negative frame. The effect is only marginally significant for the better-qualified group ( $\chi^2 = 3.20, df = 1, p < .10$ ).

This overview is a first indication that the answer to our Research Question 3 might be that expertise does not reduce the susceptibility to framing effects. Because the above classification, although common practice, is arbitrary, we are interested in the specific effects of the individual variables used to determine expertise. As participants strictly choose between two options in binary questions, the influence of the individual indicators of expertise is further tested using logistic regression models. A dummy variable for the choice between certain (= 0) and risky (= 1) options serves as the dependent variable. The *frame* in which participants respond is equally coded as dummy variable (positive = 0, negative = 1). To control for the influence of demographic factors, *age* and *gender* are included in the regressions along with the unweighted<sup>16</sup> indicators of expertise<sup>17</sup> *years of study* and *years of work*, and the interaction terms between these individual variables and the *frame*. The coefficients of the regressions are displayed in Table 4 and the marginal effects in Table 5.

<sup>16</sup>Running the same regression with the study and work experiences weighted according to the rankings assigned by participants results in no additional indicators becoming significant. As the coding of the rankings bears the potential to introduce unexpected errors, only the results obtained with the simple indicators are displayed.

<sup>17</sup>Including the self-reported interest and attitude ratings in the regression models did not reveal any significant influence. We consequently decided to omit them from the models reported in Tables 4 and 5.

**Table 4:** Coefficients of logistic regression models for the choice of the certain or risky option in the three economic policy scenarios

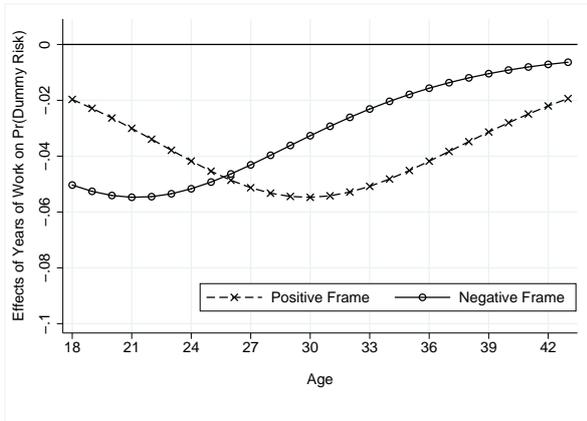
<i>Risk Dummy</i>	Bailout			Trade			Employment		
	full	no interactions	restricted	full	no interactions	restricted	full	no interactions	restricted
<i>model specification:</i>									
Frame	-6.100 (4.827)	1.675*** (.430)	1.679*** (.429)	3.311 (4.090)	.757* (.399)	1.679** (.688)	5.445 (3.956)	1.202*** (.443)	1.168*** (.435)
Age	.090 (.122)	.197** (.094)	.195** (.082)	-.012 (.170)	-.059 (.081)	-	.181 (.173)	.037 (.082)	-
Gender	-.551 (.516)	-.079 (.424)	-	1.327 (.827)	-.101 (.386)	.897 (.711)	-.445 (.838)	-.103 (.392)	-
Years of Study	-.012 (.154)	-.008 (.116)	-	.268 (.225)	.193* (.108)	.170* (.093)	-.101 (.228)	-.090 (.105)	-
Years of Work	-.173 (.141)	-.248** (.108)	-.248** (.101)	-.138 (.207)	.040 (.092)	-	-.190 (.204)	-.030 (.092)	-
Frame×Age	.287 (.230)	-	-	-.062 (.195)	-	-	-.194 (.198)	-	-
Frame×Gender	1.284 (.935)	-	-	-1.945** (.955)	-	-1.502* (.860)	.350 (.954)	-	-
Frame×Years of Study	.083 (.275)	-	-	-.071 (.264)	-	-	.005 (.258)	-	-
Frame×Years of Work	-.249 (.251)	-	-	.231 (.237)	-	-	.219 (.231)	-	-
Constant	-2.553 (2.504)	-5.364*** (1.981)	-5.408*** (1.900)	-2.316 (3.603)	-.310 (1.650)	-2.214*** (.788)	-4.720 (3.398)	-1.624 (1.760)	-1.237*** (.379)
N = 127									
R <sup>2</sup>	.292	.247	.247	.138	.084	.107	.106	.090	.082

Notes: Logistic regression with binary estimators. Risk dummy: certain = 0, risky = 1; Frame dummy: positive = 0, negative = 1; Gender dummy: male = 0, female = 1; Significance levels: \* $p < .10$ , \*\* $p < .05$ , \*\*\* $p < .01$ ; Standard errors in parentheses; Reported R<sup>2</sup> are Nagelkerke R Squares.

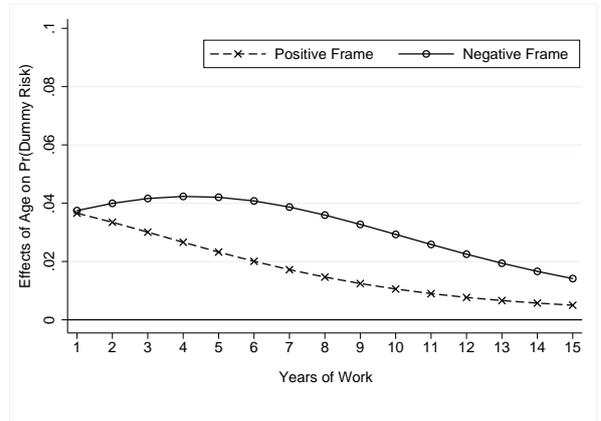
**Table 5:** Marginal effects for the choice of the certain or risky option in the three economic policy scenarios

<i>Risk Dummy</i>	Bailout				Trade			Employment		
	full	no interactions	restricted		full	no interactions	restricted	full	no interactions	restricted
<i>model specification:</i>										
Frame	-1.107 (.859)	.318*** (.061)	.319*** (.061)		.731 (.893)	.174** (.086)	.378*** (.141)	1.209 (.858)	.270*** (.089)	.264*** (.089)
Age	.016 (.022)	.037*** (.017)	.037*** (.014)		-.003 (.038)	-.014 (.018)	-	.040 (.038)	.008 (.018)	-
Gender	-.100 (.092)	-.015 (.080)	-		.293* (.176)	-.023 (.088)	.202 (.157)	-.099 (.186)	-.023 (.088)	-
Years of Study	-.002 (.028)	-.002 (.022)	-		.059 (.049)	.044* (.024)	.038* (.020)	-.022 (.051)	-.020 (.023)	-
Years of Work	-.031 (.025)	-.047*** (.019)	-.047*** (.018)		-.030 (.045)	.009 (.021)	-	-.042 (.045)	-.007 (.021)	-
Frame×Age	.052 (.041)	-	-		-.014 (.042)	-	-	-.043 (.044)	-	-
Frame×Gender	.233 (.166)	-	-		-.429*** (.198)	-	-.338* (.185)	.078 (.212)	-	-
Frame×Years of Study	.015 (.050)	-	-		-.016 (.058)	-	-	.001 (.057)	-	-
Frame×Years of Work	-.045 (.045)	-	-		.051 (.052)	-	-	.049 (.051)	-	-
N = 127										
R <sup>2</sup>	.292	.247	.247		.138	.084	.107	.106	.090	.082

*Notes:* Marginal effects for logistic regressions with binary estimators. For the binary variables the effects of discrete changes are shown, for continuous variables the marginal effects measure the instantaneous rate of change. Risk dummy: certain = 0, risky = 1; Frame dummy: positive = 0, negative = 1; Gender dummy: male = 0, female = 1; Significance levels: \* $p < .10$ , \*\* $p < .05$ , \*\*\* $p < .01$ ; Standard errors in parentheses; Reported R<sup>2</sup> are Nagelkerke R Squares.



(a) Effects on probability for *years of work* at fixed values of *age*



(b) Effects on probability for *age* at fixed values of *years of work*

Notes: Indications of the confidence intervals are omitted for the sake of better readability. The graphed marginal effects are at least significant at the 5 percent level up to *age* 40 and 14 *years of work*, thereafter at the 10 percent level.

**Figure 2:** Rates of change in probability for the variables *years of work* (Panel (a)) and *age* (Panel (b)) for choosing the risky option in the Bailout scenario fixed on each other and split by frames.

Demographic factors and indicators of expertise vary in their influence. We find very few indicators to show significant effects at all, and the direction of the effects is not uniform across different scenarios. On balance, the *frame* is the single most important influence on the choice between certain and risky options in all three ADE-like economic policy questions.

In the **Bailout** scenario, the average participant (*age* 25 and three *years of work*) has a predicted probability of choosing the risky option of 24 percent in the positive frame. A significantly higher predicted probability of choosing the risky option of 64 percent is seen in the negative frame (adjusted predictions for margins in both cases with  $p < 0.01$ ). *Age* and *years of work* have significant effects. While the two are of course highly correlated (Spearman's  $\rho = .64$ ;  $p < .01$ ), their effects go in opposite directions. As can be seen in Table 5, more work experience reduces the probability of choosing the risky option on average by about 4.7 percentage points per additional year. Tested for the complete sample the effect is significant, but not within the individual frames. Higher age increases the probability of choosing the risky option by about 3.7 percentage points per year. The significant influence of participants' age on their choices in this scenario contradicts previously published findings (Mayhorn et al., 2002; Rönnlund et al., 2005).

Figure 2 shows how *years of work* and *age* relate to each other. Interestingly, Figure 2a shows that the peak influence of *years of work* on choice behaviour shifts from around *age* 21 in the negative frame to around *age* 30 in the positive frame. In Figure 2b it can be seen that the effect of *age* in dependence of *years of work* is higher in the negative frame than in the positive frame. A Mann-Whitney test confirms the overall effect of *age* to be only significant in the negative frame ( $Z = -1.74$ ,  $p < .10$ ), when participants have to decide on the form of loss taken for helping another EU member country. With the opposing effect directions of *years of work* and *age*, the *frame* is overall the most influential variable.

The Bailout scenario strongly relates to current debates and news reports on the political development of the EU, which may increase its salience. Participants may have different feelings towards the EU with higher age and work experience, leading to differences in the situational evaluation and changed aspiration levels. When testing the correlation between *age* and the *attitude* rating towards the EU it remains, however, insignificant (Spearman's  $\rho = .05$ ;  $p > .10$ ). The correlation between *years of work* and *attitude* is also insignificant for the complete sample (Spearman's  $\rho = -.06$ ;  $p > .10$ ). Splitting the sample between participants with and without work experience (by coding work experience as a dummy variable) reveals a significant correlation between *years of work* and *attitude* for the subgroup with work experience (Spear-

**Table 6:** Binary regression results for the restricted model for the Bailout scenario with the sample split by a dummy variable for work experience.

<i>Risk Dummy</i> <i>Work Experience</i>	Bailout			
	No		Yes	
	log-odds	probability	log-odds	probability
Frame	1.588** (.784)	.83	1.994*** (.678)	.88
Age	-	-	.276** (.120)	.57
Years of Work	-	-	-.349** (.143)	.41
<i>Interest Rating</i> Economics	.894** (.377)	.71	-	-
<i>Attitude</i> EU	-	-	-.511* (.291)	.38
Constant	-4.429*** (1.633)	.01	-5.246*** (2.504)	.01
N	46		81	
R <sup>2</sup>	.252		.367	

*Notes:* Risk dummy: certain = 0, risky = 1; Frame dummy: positive = 0, negative = 1; Significance levels: \* $p < .10$ , \*\* $p < .05$ , \*\*\* $p < .01$ ; Standard errors in parentheses.

man's  $\rho = -.24$ ;  $p < .05$ ). Professionals with longer work experience show a more negative attitude towards the EU and reduced willingness to take risks for the bailout of a member country. To avoid any misinterpretations, we rerun the restricted binary regression model specification with the additional interest and attitude variables in the split sample. The results are reported in Table 6.

For the group with work experience, *attitude* is now also marginally significant in determining the choice between the risky and certain option; along with *age*, *years of work*, and the *frame*. Those without work experience are revealed to be only influenced by the *frame* and *interest in economics*. Economists and the public seem to differ systematically in their thinking (Caplan, 2001; Kirchgässner, 2005). A higher interest in economics may also indicate a different approach to reasoning in the case of the ADE and ADE-like questions. Shiloh et al. (2002) find that thinking-style scores predict the susceptibility to framing. They describe people as predominantly utilising experiential thinking-styles for everyday decisions, but changing towards more analytic processing if they are motivated to do so. Those with higher *interest in economics* ratings might be more motivated by the presented scenarios to engage in rational-analytic thinking. The influence of emotions on the effect of frames in risky-choice problems in different domains (e.g. life-death or financial) has been documented by Druckman and McDermott (2008). A more rational way of thinking about a problem could involve the exclusion of emotional concerns, leading to a reduced feeling of distress. Participants without practical work experience may be more susceptible to the tone of the general discussion about bailing out EU member states. Higher interest in economics could, for instance, stimulate the consumption of relevant (issue-framed) media reports. Such an increased reliance on external sources could lead to an informational bias, influencing distress and the formation of a risk aspiration level. Professionals have a broader background to base their aspiration level on, mitigating the influence of the general interest in economics. Despite the differences in individual indicators, the *frame* is the only variable that is significant for both groups.

In the **Trade scenario**, the average participant has a probability of choosing the risky option of 30 percent in the positive frame, and 49 percent in the negative frame (adjusted predictions for margins in both cases with  $p < 0.01$ ). Except for the *frame*, only the *years of study* variable shows a marginally significant main effect. Each additional year of study increases the likelihood of choosing the risky option. The also significant interaction term between *frame* and *gender* reveals women to be influenced more by the frame. The main effect for *gender* is not significant in the determination of choice between the risky and safe

options ( $p > .10$ ), but indicates a slight preference for the risky option. The effect of the interaction term points in the opposite direction and shows that women are more likely to choose the certain option in the negative frame. This particular outcome matches the findings of Fagley and Miller (1990) and Frisch (1993). In general, our results regarding the influence of gender are, however, more in line with the conclusions of Druckman (2001): It does not seem to have a decisive influence.

The Trade scenario differs from the other economic policy scenarios in two respects. Firstly, it is the only scenario in which the highly qualified group of participants shows a framing effect, but the less-qualified group does not. Secondly, the provided options are comparably complex and require more effort to process. The problem description is more technical and involves specialised terminology ('rare earths', 'industrial capacity', etc.). Particularly in the negative frame the outcome is only given as a shortfall of a potential maximum amount. Participants need to refer to the question itself and perform some simple calculus to arrive at the amount the trade agreement will bring in industry turnover. A potential explanation for the absence of a framing effect for the less-qualified group may simply be confusion and random choice. Because of the relatively high education level of all our participants, this seems unlikely. Yet, for the highly qualified group, the complex and atypical task may lead to an additional increase in processing effort, conditional on ability and motivation (Igou and Bless, 2007). When individuals are motivated and the ability to think about a task is high, more effort does not change the direction of thinking, but increases the extent of thinking in the direction already given by the frame. A higher level of education also suggests a high level of motivation to engage with political problems (Emler and Frazer, 1999). It additionally increases the chances that participants are already familiar with technical and complex problems, reducing the need for in-depth processing. Simon et al. (2004) argue that the depth of processing, in combination with other attributes, can influence the susceptibility to framing.

The **Employment scenario** does not show any indicator other than the *frame* to be significant in determining the choice between risky and certain options. The average participant has a probability of choosing the risky option of 23 percent in the positive frame, and 48 percent in the negative frame (adjusted predictions for margins in both cases with  $p < 0.01$ ).

Answering our Research Question 4, the insignificance of the interaction terms between the frame and indicators of expertise suggests that those criteria do not have a systematic influence on the susceptibility to framing effects in economic policy scenarios.

## 6. Discussion

In this paper we successfully reproduce Tversky and Kahneman's (1981) Asian Disease Experiment (ADE), but do not find a framing effect in Quattrone and Tversky's (1988) Employment-Inflation trade-off. This lack of a framing effect could be interpreted as failure of the external validity of their findings for samples that include professionals. However, splitting the sample by gender reveals very slight framing effects, but men and women seem to be influenced in opposite directions. Because of the distribution of characteristics in our sample we do not want to exclude the possibility of a distortion in the observed influence of the frame. Further testing of the scenario would benefit the drawing of any conclusions on its ability to support either behavioural or rational decision-making theories.

In three ADE-like hypothetical economic policy questions we consistently find framing effects. Two scenarios cause unidirectional effects and in one scenario participants show preference reversal. Overall, our results confirm equivalency framing in the economic policy domain and add to the literature challenging the descriptive validity of rational choice approaches for individual-level decision-making in the political context.

To explore the suggestion of Kühberger (1998) that experts may show weaker framing effects than novices, we use education, work experience, and self-reported interest-levels as indicators of expertise. Those attributes are common eligibility criteria for the recruitment of public officials and often used in judging the suitability of politicians for specific policy areas. As Radaelli (1999) points out, a technocratic decision-making process relying on the competences of public officials has an important influence on policy-making. We find effects to differ between scenarios, but highly qualified participants are overall no less susceptible to framing than novices. In one of the scenarios they show a preference reversal while the less qualified group does not. In another scenario only the better qualified respondents show a unidirectional framing effect.

The direction of the framing effects in our results corresponds to the predictions of Prospect Theory (Kahneman and Tversky, 1979). In the ADE participants prefer the certain option in the positive frame (risk-aversion), and the risky option in the negative frame (risk-seeking). In the economic policy questions the effect fully persists in the positive frame. In the negative frame it is either weaker (Bailout scenario) or non-existent (Trade and Employment scenarios). Given the assumed operational risk-neutrality at equal distribution of responses between the certain and risky options, this result would be in line with Tversky and Kahneman’s (1992) finding that, for moderate probabilities, people are more risk-averse in gain situation, than they are risk-seeking in loss situations.<sup>18</sup> Wang (1996) uses the strength of individual risk preferences and aspiration levels to explain effect directions. Decision-makers avoid risk in the positive frame because the certain gain is already higher than the aspiration level created by the task, content, and context. In the negative frame the perceived deficit between the aspiration level and the outcome causes the participants to seek risk.

In the life-death scenario, the emotional attachment to the outcome is strong, context factors (such as moral implications) have a big influence, and the aspiration level is high. People should be saved from death at all costs, but guaranteed survivors should also not be jeopardised. Both arguments ‘seem right’, but become more convincing within their respectively corresponding frame. Consequently, the risk preference of decision-makers is ambiguous and a bi-directional effect results. Wang (1996) suggests that risk preferences for public property and personal money are less ambiguous and aspiration levels are lower, leading to unidirectional effects. If the aspiration level is also generally lower for economic policy scenarios, doubtless gains can easily be accepted. This tendency can be a comforting characteristic for politics. Nonetheless, it invites questions on the balance between individual-level risk perception and the benefits of risk-taking in policy-making. In contrast to the life-death scenario, the material loss from a policy decision does not seem to cause people to systematically take risks. In line with Wang’s (1996, p. 148) argument that “[w]hen the risk preference is clear, a decision maker would resist a framing manipulation if it is inconsistent with the existing task-determined preference’s direction”, the results in the negative frames are close, or at least closer, to the operationally risk-neutral preference.

From a different point of view, Kühberger and Tanner (2010) argue that the incompleteness of the options in the ADE leads people to infer the unstated consequence of the option. In the negative frame, the certain option of the ADE states that 400 people will die. Respondents may not solely depend on this salient piece of information, but weigh it against the logical consequence that 200 people will live. They may also see the number as a rough and ambiguous estimate (around 400 people will die), whereas the probabilities in the risky option provide unambiguous outcome sizes (1/3 chance that *everyone* will die/live and 2/3 chance *everyone* will do the opposite). Kühberger and Tanner (2010) find that the complementarity of questions influences the occurrence of framing effects. Bohm and Lind (1992), on the other hand, produce contrary findings in a study with Swedish students. They find that a reduction of the number of people affected by the disease and the full description of outcomes (i.e. the mentioning of the respective numbers of people dying *and* being saved) do not eliminate framing effects.

An interesting question for further research in this context is whether the complementarity is interpreted differently between frames and whether it depends on the aspiration level. In the positive frame, the gain in the certain option is salient and participants may not invest further effort in inferring alternative statements of the outcome because their aspiration is satisfied. In the negative frame, the outcome goes against their preference direction and the difference to the aspiration level may cause individuals to put mental effort into interpreting the information provided by the options, reducing or eliminating the framing effect.

We also explore the varying influence of demographics and indicators of expertise on decision-making across scenarios. Indicators are mostly only significant in one scenario each, work in different directions, and are consistently weaker determinants of choice than the frames. We provide a reconstruction of the relationships between individual significances and the relevance of the particular indicator to the scenario based on the existing literature. However, any such post-hoc ‘match-making’ can, of course, only serve as a

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<sup>18</sup>Although Tversky and Kahneman (1992) find the function for decision weights for losses to lie below the weighting function for gains at moderate and high probabilities (and thus to indicate the higher risk aversion for gains than risk-seeking for losses), they ultimately argue for the use of equal weighting functions as approximations.

clue from where to start further research on the reliability of the observed influences of these indicators.

## 7. Conclusion

While framing research and Prospect Theory have made some advances in the analysis and explanation of political decision-making, the alleged (although reducing) dislike of methods from psychology (Mercer, 2005) in the political sciences has left the application of behavioural accounts of choice behaviour trailing far behind other social sciences, especially economics (Schnellenbach and Schubert, 2014). The continued use of rational choice as favourite tool for normative and prescriptive theories of political decision-making is often motivated with its advantages in modelling and prediction accuracy. The cost, however, comes with the blending out of empirical evidence of actual behaviour. Our survey results show that equivalency framing effects can occur in the decision-making on economic policy issues. This finding opens the floor for many further questions, but also problems. The creation and influence of frames in policy-making will also depend on the aggregation of decisions and the dynamics of different processes. In practice not only individuals' considerations and aspiration levels count, but also a range of other influences. The roles of internal (e.g. inter-institutional colleagues, auditors, legal examiners, and lawyer-linguists) and external (e.g. lobbyists and political advisers) actors in the creation and neutralisation of equivalency frames and the process by which frames are carried through a political discourse call for exploration. Rational-choice accounts are comparably weak in providing adequate descriptions and explanations of environmental influences on choice behaviour. Prospect Theory offers more possibilities in this regard, as it allows for varying reference points and the establishment of context-dependent gain and loss domains (McDermott, 2004).

Cooper and Kovacic (2012) suggest that the feedback mechanisms to limit behavioural biases are not as elaborate and fast in institutional decision-making as they are, for instance, in firms. Given the lack of feedback as a reliable way to improve decision-quality, the argument that expert decision-makers might be less responsive to equivalency framing effects has a strong appeal. The notion of expertise is a fundamental aspect of the recruitment of public officials and the judging of politicians' suitability. However, the variables commonly used for these purposes, which we evaluated in this paper, do not seem to reduce framing effects. To the contrary, sometimes our 'experts' were even more susceptible than the non-experts. This observed influence of the phrasing of equivalent economic policy options on choice behaviour is a particular cause for concern when decision-making power is concentrated. When scrutiny is limited, the decision-quality may be subject to the behavioural biases of few. The links between specific policy areas, task domains, and individual attributes of decision-makers still offer a lot of ground for further research. The influence of framing effects throughout the policy-making process and the clarification of the roles other factors such as institutional rules and culture can play in limiting them deserve attention.

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## Appendix A. Reproduced questions

### Appendix A.1. Asian disease experiment (Tversky and Kahneman, 1981, p. 453)

Imagine that the [EU] is preparing for the outbreak of an unusual disease, which is expected to kill 600 people. Two alternative programs to combat the disease have been proposed. Assume that the exact scientific estimates of the consequences of the programs are as follows:

#### Positive frame:

If Program A is adopted, 200 people will be saved.

If Program B is adopted, there is 1/3 probability that 600 people will be saved, and 2/3 probability that no people will be saved.

#### Negative frame:

If Program C is adopted 400 people will die.

If Program D is adopted there is 1/3 probability that nobody will die, and 2/3 probability that 600 people will die.

### Appendix A.2. Quattrone and Tversky's (1988, p. 727) employment-inflation trade-off

Political decision-making often involves a considerable number of trade-offs. A programme that benefits one segment of the population may work to the disadvantage of another segment. Policies designed to lead to higher rates of employment frequently have an adverse effect on inflation. Imagine you were faced with the decision of adopting one of two economic policies.

#### Positive frame:

The following table summarizes the alternative policies and their likely consequences:

	Employed	Inflation
Programme A	90%	12%
Programme B	95%	17%

Imagine you were faced with the decision of adopting programme A or programme B.

If programme A is adopted, 90% of the work force would be employed, while the rate of inflation would be 12%.

If programme B is adopted, 95% of the work force would be employed, while the rate of inflation would be 17%.

#### Negative frame:

The following table summarizes the alternative policies and their likely consequences:

	Unemployed	Inflation
Programme A	10%	12%
Programme B	5%	17%

Imagine you were faced with the decision of adopting programme A or programme B.

If programme A is adopted, 10% of the work force would be unemployed, while the rate of inflation would be 12%.

If programme B is adopted, 5% of the work force would be unemployed, while the rate of inflation would be 17%.

## Appendix B. Hypothetical economic policy questions

### Appendix B.1. Bailout question

Due to the crisis a member country of the EU needs 6 billion Euro in bailout money. Two different schemes are available to provide the money, but take different approaches to managing the risk. Which one would you prefer?

#### Positive frame:

If plan A is adopted 2 billion will be repaid.

If plan B is adopted there is 1/3 probability that all will be repaid, and 2/3 probability that nothing will be repaid.

#### Negative frame:

If plan A is adopted 4 billion will be lost.

If plan B is adopted there is 2/3 probability that all will be lost, and 1/3 probability that nothing will be lost.

### *Appendix B.2. Trade agreement question*

The negotiations for new trade agreements for rare earths between the EU and China are at a critical point. China had only recently reduced the export levels for rare earths, but demand in Europe has been rising constantly. There is industrial capacity to generate turnover anywhere between €0 and €2 billion. Two different trade agreements are possible, but only one can be implemented. You are part of the responsible negotiation team and have to take sides for one of the following options:

#### Positive frame:

If agreement A is signed EU industries will get rare earths at a fixed annual amount. This will be enough to produce goods to generate €1 billion turnover per year.

If agreement B is signed EU industries will get a fixed share of the annual production. There is a 40% chance that enough will be available to produce goods worth €1.25 billion per year, and a 60% chance that supply will only be enough to generate €833 million.

#### Negative frame:

If agreement A is signed EU industries will get rare earths at a fixed annual amount. But this will not be enough to produce goods at full capacity. The generated turnover will be €1 billion less than at maximum capacity.

If agreement B is signed EU industries will get a fixed share of the annual production. There is a 40% chance that shortages will lead to a turnover of €750 million less than maximum capacity, and a 60% chance that €1166 million less than maximum will be realised.

### *Appendix B.3. Employment question*

A large industry sector has been run under a state controlled system that kept production at specified amounts for a long time. The current consensus is that the control of production should be eliminated. There are concerns about rising unemployment after the abolition of the current system. Two programmes have been developed to deal with the changes and experts estimated the following outcomes. Choose one of them.

#### Positive frame:

If programme A is adopted 2/3 of workers will keep their jobs.

If programme B is adopted there is 2/3 probability that all workers will keep their jobs and 1/3 probability that nobody will keep their jobs.

#### Negative frame:

If programme A is adopted 1/3 of workers will lose their jobs.

If programme B is adopted there is 1/3 probability that everybody will lose their jobs and 2/3 probability that nobody will lose their jobs.

## References

- Afonso, A., 2007. Policy change and the politics of expertise: Economic ideas and immigration control reforms in Switzerland. *Swiss Political Science Review* 13(1), 1–38. DOI: 10.1002/j.1662-6370.2007.tb00068.x.
- Bazerman, M.H., 1984. The relevance of Kahneman and Tversky's concept of framing to organizational behavior. *Journal of Management* 10(3), 333–343. DOI: 10.1177/014920638401000307.
- Bendor, J., 2010. *Bounded Rationality and Politics*. Volume 6. Berkley: University of California Press.
- Bless, H., Betsch, T., Franzen, A., 1998. Framing the framing effect: The impact of context cues on solutions to the 'Asian disease' problem. *European Journal of Social Psychology* 28(2), 287–291. DOI: 10.1002/(SICI)1099-0992(199803/04)28:2<287::AID-EJSP861>3.0.CO;2-U.
- Boettcher, W.A., 2004. The prospects for prospect theory: An empirical evaluation of international relations applications of framing and loss aversion. *Political Psychology* 25(3), 331–362. DOI: 10.1111/j.1467-9221.2004.00375.x.
- Bohm, P., Lind, H., 1992. A note on the robustness of a classical framing result. *Journal of Economic Psychology* 13(2), 355–361. DOI: 10.1016/0167-4870(92)90039-A.
- Boswell, C., 2008. The political functions of expert knowledge: Knowledge and legitimation in European Union immigration policy. *Journal of European Public Policy* 15(4), 471–488. DOI: 10.1080/13501760801996634.
- Bütler, M., Maréchal, M., 2007. Framing effects in political decision making: Evidence from a natural voting experiment. CEifo Working Paper No. 1940. URL: <http://www.econstor.eu/dspace/bitstream/10419/25985/1/538080965.PDF>.
- Byrnes, J.P., Miller, D.C., Schafer, W.D., 1999. Gender differences in risk taking: A meta-analysis. *Psychological Bulletin* 125(3), 367–383. DOI: 10.1037//0033-2909.125.3.367.
- Caplan, B., 2001. What makes people think like economists? Evidence on economic cognition from the "Survey of Americans and Economists on the Economy". *Journal of Law and Economics* 44(2), 395–426. DOI: 10.1086/322812.
- Christensen, J., 2015. Recruitment and expertise in the European Commission. *West European Politics* 38(3), 649–678. DOI: 10.1080/01402382.2014.982353.
- Cooper, J.C., Kovacic, W.E., 2012. Behavioral economics: Implications for regulatory behavior. *Journal of Regulatory Economics* 41(1), 41–58. DOI: 10.1007/s11149-011-9180-1.
- Druckman, J., 2001. Evaluating framing effects. *Journal of Economic Psychology* 22(1), 91–101. DOI: 10.1016/S0167-4870(00)00032-5.
- Druckman, J., McDermott, R., 2008. Emotion and the framing of risky choice. *Political Behavior* 30(3), 297–321. DOI: 10.1007/s11109-008-9056-y.
- Eckel, C.C., Grossman, P.J., 2008. Men, women and risk aversion: Experimental evidence. *Handbook of Experimental Economics Results* 1, 1061–1073. DOI: 10.1016/s1574-0722(07)00113-8.
- Emler, N., Frazer, E., 1999. Politics: The education effect. *Oxford Review of Education* 25(1-2), 251–273. DOI: 10.1080/030549899104242.
- European Commission, 2012a. Gender equality in the European Commission. URL: [http://ec.europa.eu/justice/gender-equality/files/womenonboards/factsheet-general-4\\_en.pdf](http://ec.europa.eu/justice/gender-equality/files/womenonboards/factsheet-general-4_en.pdf).
- European Commission, 2012b. Permanent officials. URL: [http://ec.europa.eu/civil\\_service/job/official/index\\_en.htm](http://ec.europa.eu/civil_service/job/official/index_en.htm).
- European Parliament, 2014. Women in the European Parliament. URL: [http://www.europarl.europa.eu/RegData/publications/2014/0001/P7\\_PUB\(2014\)0001\\_EN.pdf](http://www.europarl.europa.eu/RegData/publications/2014/0001/P7_PUB(2014)0001_EN.pdf).
- Fagley, N.S., Miller, P.M., 1987. The effects of decision framing on choice of risky vs certain options. *Organizational Behavior and Human Decision Processes* 39(2), 264–277. DOI: 10.1016/0749-5978(87)90041-0.
- Fagley, N.S., Miller, P.M., 1990. The effect of framing on choice interactions with risk-taking propensity, cognitive style, and sex. *Personality and Social Psychology Bulletin* 16(3), 496–510. DOI: 10.1177/0146167290163008.
- Fellner, G., Maciejovsky, B., 2007. Risk attitude and market behavior: Evidence from experimental asset markets. *Journal of Economic Psychology* 28(3), 338–350. DOI: 10.1016/j.joep.2007.01.006.
- Fiske, S.T., Kinder, D.R., Larter, W.M., 1983. The novice and the expert: Knowledge-based strategies in political cognition. *Journal of Experimental Social Psychology* 19(4), 381–400. DOI: 10.1016/0022-1031(83)90029-X.
- Frisch, D., 1993. Reasons for framing effects. *Organizational Behavior and Human Decision Processes* 54(3), 399–429. DOI: 10.1006/obhd.1993.1017.
- Green, D.P., Shapiro, I., 1994. *Pathologies of Rational Choice Theory: A Critique of Applications in Political Science*. New Haven: Yale University Press.
- Harstad, R.M., Selten, R., this issue. Diminished-dimensional political economy. *European Journal of Political Economy*.
- Henrich, J., Heine, S.J., Norenzayan, A., 2010. The weirdest people in the world? *Behavioral and Brain Sciences* 33(2-3), 61–135. DOI: 10.1017/S0140525X0999152X.
- Igou, E.R., Bless, H., 2007. On undesirable consequences of thinking: Framing effects as a function of substantive processing. *Journal of Behavioral Decision Making* 20(2), 125–142. DOI: 10.1002/bdm.543.
- Kahan, D.M., Dawson, E.C., Peters, E., Slovic, P., 2013. Motivated numeracy and enlightened self-government. Yale Law School, The Cultural Cognition Project, Working Paper (116). URL: [http://www.cogsci.bme.hu/~ktkuser/KURZUSOK/BMETE47MC15/2013\\_2014\\_1/kahanEtA12013.pdf](http://www.cogsci.bme.hu/~ktkuser/KURZUSOK/BMETE47MC15/2013_2014_1/kahanEtA12013.pdf).
- Kahneman, D., 1992. Reference points, anchors, norms, and mixed feelings. *Organizational Behavior and Human Decision Processes* 51(2), 296–312. DOI: 10.1016/0749-5978(92)90015-Y.
- Kahneman, D., 2003. Maps of bounded rationality: Psychology for behavioral economics. *American Economic Review* 93(5), 1449–1475. DOI: 10.1257/000282803322655392.
- Kahneman, D., Tversky, A., 1979. Prospect theory: An analysis of decision under risk. *Econometrica* 47(2), 263–291. DOI: 10.2307/1914185.

- Kahneman, D., Tversky, A., 2000. *Choices, Values, and Frames*. Cambridge University Press, New York.
- Kam, C.D., Simas, E.N., 2010. Risk orientations and policy frames. *The Journal of Politics* 72(2), 381–396. DOI: 10.1017/S0022381609990806.
- Kassim, H., Peterson, J., Bauer, M.W., Connolly, S., Dehousse, R., Hooghe, L., Thompson, A., 2013. *The European Commission of the Twenty-First Century*. Oxford University Press, Oxford.
- Kirchgässner, G., 2005. (Why) are economists different? *European Journal of Political Economy* 21(3), 543–562. DOI: 10.1016/j.ejpolco.2005.05.003.
- Kőszegi, B., Rabin, M., 2006. A model of reference-dependent preferences. *Quarterly Journal of Economics* 121(4), 1133–1165. DOI: 10.1093/qje/121.4.1133.
- Kőszegi, B., Rabin, M., 2007. Reference-dependent risk attitudes. *American Economic Review* 97(4), 1047–1073. DOI: 10.1257/aer.97.4.1047.
- Krosnick, J., 1990. Expertise and political psychology. *Social Cognition* 8(1), 1–8. DOI: 10.1521/soco.1990.8.1.1.
- Kühberger, A., 1998. The influence of framing on risky decisions: A meta-analysis. *Organizational Behavior and Human Decision Processes* 75(1), 23–55. DOI: 10.1006/obhd.1998.2781.
- Kühberger, A., Schulte-Mecklenbeck, M., Perner, J., 1999. The effects of framing, reflection, probability, and payoff on risk preference in choice tasks. *Organizational Behavior and Human Decision Processes* 78(3), 204–231. DOI: 10.1006/obhd.1999.2830.
- Kühberger, A., Tanner, C., 2010. Risky choice framing: Task versions and a comparison of prospect theory and fuzzy-trace theory. *Journal of Behavioral Decision Making* 23(3), 314–329. DOI: 10.1002/bdm.656.
- Lawrence, E.D., 2010. What Americans know and why it matters for politics, Annual Meeting of the Midwest Political Science Association. URL: [http://projects.iq.harvard.edu/files/cces/files/Lawrence-What\\_Americans\\_Know.pdf](http://projects.iq.harvard.edu/files/cces/files/Lawrence-What_Americans_Know.pdf).
- LeBoeuf, R.A., Shafir, E., 2003. Deep thoughts and shallow frames: On the susceptibility to framing effects. *Journal of Behavioral Decision Making* 16(2), 77–92. DOI: 10.1002/bdm.433.
- Levin, I., Gaeth, G., Schreiber, J., 2002. A new look at framing effects: Distribution of effect sizes, individual differences, and independence of types of effects. *Organizational Behavior and Human Decision Processes* 88(1), 411–429. DOI: 10.1006/obhd.2001.2983.
- Levin, I., Snyder, M., Chapman, D., 1988. The interaction of experiential and situational factors and gender in a simulated risky decision-making task. *The Journal of Psychology* 122(2), 173–181. DOI: 10.1080/00223980.1988.9712703.
- Levy, J., 1997. Prospect theory, rational choice, and international relations. *International Studies Quarterly* 41(1), 87–112. DOI: 10.1111/0020-8833.00034.
- Levy, J., 2003. Applications of prospect theory to political science. *Synthese* 135(2), 215–241. DOI: 10.1023/A:1023413007698.
- Linde, J., Vis, B., 2014. Do behavioral theories like prospect theory apply to political actors? An experimental test on a sample of Dutch parliamentarians and students, Dutch/Flemish Politicologenetmaal, Maastricht, The Netherlands.
- List, J.A., 2004. Neoclassical theory versus prospect theory: Evidence from the marketplace. *Econometrica* 72(2), 615–625. DOI: 10.1111/j.1468-0262.2004.00502.x.
- Loewen, P.J., Sheffer, L., Soroka, S., Walgrave, S., Shaefer, T., 2014. Expertise and efficacy in elite political decision making, Behavioral Models of Politics Conference, Duke University. URL: [http://sites.duke.edu/2014bmp/files/2014/10/Loewen\\_et\\_al.pdf](http://sites.duke.edu/2014bmp/files/2014/10/Loewen_et_al.pdf).
- Mayhorn, C.B., Fisk, A.D., Whittle, J.D., 2002. Decisions, decisions: Analysis of age, cohort, and time of testing on framing of risky decision options. *Human Factors: The Journal of the Human Factors and Ergonomics Society* 44(4), 515–521. DOI: 10.1518/0018720024496935.
- McDermott, R., 1998. *Risk-Taking in International Politics: Prospect theory in American Foreign Policy*. Ann Arbor: University of Michigan Press.
- McDermott, R., 2004. Prospect theory in political science: Gains and losses from the first decade. *Political Psychology* 25(2), 289–312. DOI: 10.1111/j.1467-9221.2004.00372.x.
- Mercer, J., 2005. Prospect theory and political science. *Annual Review of Political Science* 8, 1–21. DOI: 10.1146/annurev.polisci.8.082103.104911.
- Meza, D., Webb, D.C., 2007. Incentive design under loss aversion. *Journal of the European Economic Association* 5(1), 66–92. DOI: 10.1162/JEEA.2007.5.1.66.
- von Neumann, J., Morgenstern, O., 1947. *The Theory of Games and Economic Behavior*. Princeton University Press.
- Nordstokke, D.W., Zumbo, B.D., Cairns, S.L., Saklofske, D.H., 2011. The operating characteristics of the nonparametric Levene test for equal variances with assessment and evaluation data. *Practical Assessment, Research & Evaluation* 16(5), 1–8.
- Nullmeier, F., 2005. Knowledge and decision-making, in: Maasen, S., Weingart, P. (Eds.), *Democratization of Expertise? Exploring Novel Forms of Scientific Advice in Political Decision-Making*. Springer Netherlands, pp. 123–134. DOI: 10.1007/1-4020-3754-6\_7.
- Peters, B.G., 2005. *Institutional Theory in Political Science: The new Institutionalism*. 2 ed, London: Continuum.
- Peters, E., Levin, I.P., 2008. Dissecting the risky-choice framing effect: Numeracy as an individual-difference factor in weighting risky and riskless options. *Judgment and Decision Making* 3(6), 435–448.
- Peters, E., Västfjäll, D., Slovic, P., Mertz, C., Mazzocco, K., Dickert, S., 2006. Numeracy and decision making. *Psychological Science* 17(5), 407–413. DOI: 10.1111/j.1467-9280.2006.01720.x.
- Pollack, M.A., 2006. Rational choice and EU politics, in: Jørgensen, K.E., Pollack, M.A., Rosamond, B. (Eds.), *Handbook of European Union Politics*. London: Sage, pp. 31–55. DOI: 10.4135/9781848607903.
- Powell, M., Ansic, D., 1997. Gender differences in risk behaviour in financial decision-making: An experimental analysis. *Journal of Economic Psychology* 18(6), 605–628. DOI: 10.1016/S0167-4870(97)00026-3.

- Quattrone, G.A., Tversky, A., 1988. Contrasting rational and psychological analyses of political choice. *American Political Science Review* 82(3), 719–736. DOI: 10.2307/1962487.
- Radaelli, C., 1999. The public policy of the European Union: whither politics of expertise? *Journal of European Public Policy* 6(5), 757–774. DOI: 10.1080/135017699343360.
- Rayner, S., 2003. Democracy in the age of assessment: reflections on the roles of expertise and democracy in public-sector decision making. *Science and Public Policy* 30(3), 163–170. DOI: 10.3152/147154303781780533.
- Rönnlund, M., Karlsson, E., Lagnäs, E., Larsson, L., Lindström, T., 2005. Risky decision making across three arenas of choice: Are younger and older adults differently susceptible to framing effects? *The Journal of General Psychology* 132(1), 81–93. DOI: 10.3200/GENP.132.1.81-93.
- Schmidt, U., Starmer, C., Sugden, R., 2008. Third-generation prospect theory. *Journal of Risk and Uncertainty* 36(3), 203–223. DOI: 10.1007/s11166-008-9040-2.
- Schnellenbach, J., Schubert, C., 2014. Behavioral political economy: A survey. CESifo Working Paper (No. 4988). URL: [http://www.cesifo-group.de/portal/page/portal/lang-en/DocBase\\_Content/WP/WP-CESifo\\_Working\\_Papers/wp-cesifo-2014/wp-cesifo-2014-09/cesifo1\\_wp4988.pdf](http://www.cesifo-group.de/portal/page/portal/lang-en/DocBase_Content/WP/WP-CESifo_Working_Papers/wp-cesifo-2014/wp-cesifo-2014-09/cesifo1_wp4988.pdf).
- Shiloh, S., Salton, E., Sharabi, D., 2002. Individual differences in rational and intuitive thinking styles as predictors of heuristic responses and framing effects. *Personality and Individual Differences* 32(3), 415–429. DOI: 10.1016/S0191-8869(01)00034-4.
- Simon, A.F., Fagley, N., Halleran, J.G., 2004. Decision framing: Moderating effects of individual differences and cognitive processing. *Journal of Behavioral Decision Making* 17(2), 77–93. DOI: 10.1002/bdm.463.
- Simon, H.A., 1995. Rationality in political behavior. *Political Psychology* 16(1), 45–61. DOI: 10.2307/3791449.
- Strøm, K., 2000. Delegation and accountability in parliamentary democracies. *European Journal of Political Research* 37(3), 261–290. DOI: 10.1023/A:1007064803327.
- Tversky, A., Kahneman, D., 1981. The framing of decisions and the psychology of choice. *Science* 211(4481), 453–458. DOI: 10.1126/science.7455683.
- Tversky, A., Kahneman, D., 1986. Rational choice and the framing of decisions. *The Journal of Business* 59(4/2), S251–S278. DOI: 10.1086/296365.
- Tversky, A., Kahneman, D., 1992. Advances in prospect theory: Cumulative representation of uncertainty. *Journal of Risk and Uncertainty* 5(4), 297–323. DOI: 10.1007/BF00122574.
- Wang, X., 1996. Framing effects: Dynamics and task domains. *Organizational Behavior and Human Decision Processes* 68(2), 145–157. DOI: 10.1006/obhd.1996.0095.
- Wiseman, D.B., Levin, I.P., 1996. Comparing risky decision making under conditions of real and hypothetical consequences. *Organizational Behavior and Human Decision Processes* 66(3), 241–250. DOI: 10.1006/obhd.1996.0053.