Stockholm School of Economics, Course 659

Bachelor's Thesis

Can net transfers buy support from anxious citizens?

A micro-level test of the embedded liberalism thesis in the European Union

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Abstract

This thesis examines the hypothesis of whether or not risk aversion, as a personality trait, has a negative impact on evaluations of EU membership. Furthermore, building upon the 'embedded liberalism thesis' as introduced by Ruggie (1982), we hypothesise that net transfers from the EU budget may attenuate the presumed negative impact of risk aversion on attitudes towards the EU. Using survey data from the Eurobarometer 71.3 (2009), our results provide evidence in line with both these hypotheses, suggesting that risk averse citizens may in fact worry less about risks emanating from market integration, when living in a country receiving high levels of transfers from the EU budget compared to its GDP. We argue that the notion of embedded liberalism can be seen as an integral part of EU policymaking and that net transfers are effective at a micro-level in building support for the EU among those who would otherwise oppose it.

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1 Introduction

'Nobody can fall in love with the single market' —Jacques Delors

How are the attitudes of individuals towards the European Union (EU) shaped? Hitherto, a large number of economic and non-economic determinants of attitudes towards the EU have been examined in an extensive body of literature. The findings suggest that factors relating to individual economic self-interest, personality, and neighbourhood attachment can help explain variations in support for EU membership (Hooghe and Marks 2004).

A common approach has been to theorise on how individuals shape their preferences according to how they themselves would benefit or lose from market integration within the EU. This research is closely related to a growing body of literature studying how the perceptions of individuals towards free trade, in more general terms, are shaped. This field of the literature has primarily built on trade theory to hypothesise how individuals evaluate trade policy.

However, in the case of the EU, an important difference is that market integration today comes hand in hand with redistribution through the EU budget. Whilst individuals' concerns relating to the consequences of market integration seem to affect how they evaluate the EU, it has also been shown that individuals living in countries receiving high levels of net transfers tend to be more pro-EU than others (Anderson and Reichert 1995).

In this thesis, we build upon a few recent papers studying how risk aversion—as a personality trait—influences attitudes towards trade policy (Mayda, O'Rourke and Sinnott 2007; Ehrlich and Maestas 2010; Ehrlich and Hearn 2013). A novel aspect of this thesis is the study of the specific effect of risk aversion on attitudes towards the EU.

The hypothesis that risk aversion can have an impact on attitudes towards EU membership builds on the assumption that free trade policies within the EU do in fact expose citizens to increased risk. Following the argument presented by Rodrik (1998), we present a simplified model supporting these claims. Additionally, we assume that citizens perceive themselves as exposed to this risk.[1] If this is the case, risk averse individuals should theoretically be more opposed to further market integration. Indeed, in support of the hypothesis, we find that risk averse individuals tend to be more negative towards an integrated EU market.

Our second hypothesis is that, given risk aversion does indeed influence how individuals evaluate the internal market, this effect can be reduced in cases where an individual lives in a country receiving high levels of net transfers from the EU. In other words, whereas net transfers have already been shown to increase support for EU membership, our hypothesis is that they partly do this by *attenuating* the assumed negative impact of risk aversion. Thus, the focus of this paper is to study whether *supranational* policies (in addition to national policies) can affect individuals' attitudes at a micro-level, through

[1] As did, presumably, the Swedish construction workers who went on strike to blockade the building site in Vaxholm, Sweden, where Latvian construction workers were renovating a school.

the channel of risk aversion.

This second hypothesis builds on the so-called 'embedded liberalism thesis', as introduced by Ruggie (1982). According to this thesis, governments who pursue free trade policies risk losing support from citizens who are exposed to the risks that come with market liberalization. In order to maintain the public support needed to pursue these policies, governments can compensate citizens by 'sheltering' them with support from the welfare state. Evidence in line with the embedded liberalism thesis has been provided through prior micro-level tests (Mayda, O'Rourke and Sinnott 2007; Ehrlich and Hearn 2013). However, no study has yet examined whether *supranational* redistribution also can moderate the negative effect of risk aversion on attitudes towards trade policy. Thus, we aim to examine, at a micro-level, whether this thesis is valid within the context of the EU. This is done by testing for interaction between individual risk aversion and the level of net transfers to the individual's home country. We find statistically significant results supporting this hypothesis. In other words, the more money a country receives from the EU, the less it's citizens seem to worry about the consequences of market integration.

2 Previous Research

This thesis primarily builds upon three strands of literature that are partly interconnected: The main pillar is the thesis of 'embedded liberalism', initially introduced by Ruggie (1982). Second, we draw from previous theories and studies investigating how individuals' preferences towards trade policy are shaped. At last, we review research on how individuals' attitudes towards the EU are shaped. The first part is to be seen as an explanation for the hypotheses of this thesis, whereas the latter provide context as well as justification for variables used in the analysis.

2.1 The Thesis of Embedded Liberalism

According to Ruggie (1982), the international expansion of free trade after World War II was both accompanied and facilitated by growing welfare states; incumbent governments began 'sheltering' citizens harmed by free trade policies by providing compensation through the welfare state. By doing so governments managed to maintain public support for free trade. This is why the thesis is referred to as the *compromise* of embedded liberalism. After the protectionist measures that followed the Great Depression, pro-trade governments had realized that they needed to pay attention to the distributional consequences of free trade in order to maintain support for such policies. This embedded liberalism could thus be seen as a way of balancing between the two extremes of economic nationalism and full economic liberalism.

In the same spirit, Rodrik (1998) suggested that there may be a degree of complementarity between markets and governments due to the possibility for governments to build public support for market oriented policies, as claimed by the embedded liberalism thesis. Using a data set for more than 100 countries, including both developing and developed

countries, he demonstrated a positive correlation between the degree of openness to international trade and the degree of welfare spending. He argued that the explanation for this correlation is that governments can choose to play a risk-reducing role when the country is opening up to more free trade. This is accomplished by the incumbent government by either providing welfare policies directly aimed at those harmed by exposure to international trade, or simply by increasing public spending in general. A theoretical model is developed in section 3 of this thesis. Rodrik argued further that, in general, developing countries with less administrative capacity have to rely on less direct measures such as public employment and public-works programs, whereas advanced countries can effectively use social welfare programs for the same purpose.

While this correlation between government size and degree of openness is also supported by the findings of, for example Adserà and Boix (2002) and Mares (2004), Iversen and Cusack (2000) instead argued that increases in welfare spending have been a consequence of de-industrialisation instead of trade liberalisation. Hays, Ehrlich and Peinhardt (2005) investigated both of these hypotheses and found evidence suggesting that both de-industrialisation and trade liberalisation have an effect on welfare spending.

2.1.1 Individual-level Tests of Embedded Liberalism

If Ruggie and Rodrik are correct in their claims that governments try to compensate citizens which are adversely affected by trade liberalisation, how do individual citizens respond to this? How likely are citizens to be persuaded by their governments to support free trade in return for economic compensation?

These questions have previously been posed by, for instance Mayda, O'Rourke and Sinnott (2007), who argued that if more open economies are subject to increased risk, then risk averse individuals should be more opposed to free trade policies. Thus, they study the same link between risk aversion and trade policy preferences as done in this thesis. However, whereas they use data from East Asian, South Asian and Western European countries for this purpose, the focus here is on perceptions of market liberalisation within the EU. Mayda, O'Rourke and Sinnott found support for their hypotheses that risk aversion negatively affects attitudes towards free trade policies as well as that government expenditure can reduce this negative effect.

Another micro-level test of the theory of embedded liberalism, similar to the one just described, was employed by Hays, Ehrlich and Peinhardt (2005). Instead of studying the effect of risk aversion among individuals, they test if government compensation, in the form of unemployment insurance or labour market programs, builds support for free trade. Their empirical findings, based on data from 13 OECD countries, suggest that the level of government expenditure on labour policy programs is positively correlated with pro-trade attitudes.

The specific effect of 'risk orientation'—a concept including the scale from risk acceptant to risk neutral to risk averse—on individuals' public policy attitudes has more recently been investigated by Ehrlich and Maestas (2010) and Ehrlich and Hearn (2013). In both papers risk aversion was measured through the response to the following question: 'In general, people often have to take risks when making financial, career or other life

decisions. Overall, how would you place yourself on the following scale?'. Thus, this measure is more comprehensive than those used in this thesis and Mayda, O'Rourke and Sinnott (2007) as it includes both sides of the risk aversion scale and doesn't only group respondents between risk averse and 'not risk averse'.

In contrast to studying the aggregate effect of risk aversion, Ehrlich and Maestas (2010) argued that risk aversion should *only* have an effect on those who are actually exposed to the potential gains or losses from free trade. According to the Stolper-Samuelson Theorem trade will affect skilled and unskilled individuals differently, and this will then change the effect of their risk orientation. Using survey data from the US, a relatively skill-abundant country, they found that among low-skilled individuals only risk aversion leads to opposition of free trade, whereas among high-skilled only risk *acceptance* (positively) impacts the support of trade. These findings do indeed suggest that both risk orientation and exposure to risk have an effect on the support of trade policies. Consequently, they argue that these determinants should be considered jointly when hypothesizing how preferences are shaped, as risk orientation seems to moderate the effect of risk exposure.

In a related paper, Ehrlich and Hearn (2013) aimed to study the micro-foundations of the embedded liberalism thesis more directly by investigating how individuals' *knowledge* of a specific compensation program affects their attitudes towards free trade policies. Survey data from the US is used and their results suggests that low-income individuals with knowledge of the compensation program tend to support free trade to a greater extent. However, high-income individuals were found to reduce their support for free trade when exposed to knowledge about the same program. The authors concluded that whereas the increased support among low-income individuals provides evidence in line with the embedded liberalism thesis, this increased support for free trade is not unconditional as it seems to have an opposite effect among high-skilled individuals. In other words, the question if state compensation is effective in increasing support for free trade is highly dependent on the aggregate differential effects among the citizens.

The literature examining the effect of risk aversion on policy attitudes remains rather scarce. However, the results from previous studies indicate that risk aversion may be a relevant factor to consider in public opinion studies. For example, Ehrlich and Maestas (2010) suggested that incorporating risk orientation into public opinion studies may help explain aggregate public policy shifts. In this thesis, we do not aim to study how attitudes towards the EU differ depending on the *individual* potential gains or losses from market integration. Instead, we investigate if risk aversion has an aggregate effect on perceptions of EU membership, and if the EU can be the entity mitigating some of these assumed effects.

2.2 Determinants of Trade Policy Preferences

Unlike the literature studying the specific effect of risk aversion, the literature investigating determinants of trade policy preferences is quite rich. We here briefly summarise some possible determinants identified in the literature as justification for our choice of control variables.

The interest in studying how trade policy attitudes are shaped is primarily motivated from a policy perspective. O'Rourke and Sinnott (2001) argued that factors influencing attitudes towards trade policy are of interest from a policy perspective since voter preferences both limit and influence decisions made by politicians. Additionally, factors influencing trade policy preferences are of interest since the public opinion about free trade often seems to diverge from the strong consensus among economists on its desirability (Mayda and Rodrik 2005).

As liberalisation of international trade affects a country's income-distribution—and thus creates winners and losers in the short term—most of the literature has focused on how economic factors influence trade policy preferences (Ehrlich and Maestas 2010). Depending on the framework of trade theory used to predict these preferences, different hypotheses have emerged. Essentially, the dominant hypotheses depend on if one assumes intersectoral factor mobility, as in a Heckscher-Ohlin framework, or if one predicts preferences according to the Ricardo-Viner framework, where factors of production do not move across sectors.

Hitherto, the Heckscher-Ohlin theory remains the most commonly used economic model to predict individual preferences (Ehrlich and Hearn 2013). With intersectoral factor mobility voter preferences should be determined by factor preferences. In other words, when workers can move costlessly across sectors, their preferences towards trade policy should depend on their individual level of skill. For example, in a skill-abundant country, high-skilled workers should prefer free trade as they would themselves gain from trade liberalization, whereas low-skilled workers should oppose those same policies. In a relatively less skill-abundant country, however, the causality should run in the opposite direction. This hypothesis has been tested in a number of studies. Using individual-level data from twenty countries, O'Rourke and Sinnott (2001) found that low-skilled workers in countries with per capita income below $ 12,000 had a tendency of being more positive to free trade, whereas low-skilled workers in richer countries tended to oppose free trade to a greater extent. Similar results are found by Scheve and Slaughter (2001), Mayda and Rodrik (2005), Hays, Ehrlich and Peinhardt (2005) and Mayda, O'Rourke and Sinnott (2007), including another measure of skill-level, namely the level of education.

Several studies have also investigated if trade policy attitudes are related to sector of employment, as predicted by the Ricardo-Viner framework. However, these studies are not entirely in agreement. For example, Scheve and Slaughter (2001) found little evidence that individuals employed in industries with greater estimated comparative disadvantage are more protectionist than others. They conclude that, in the United States, factor type explains attitudes towards trade policy to a greater extent than does industry of employment. Others have found differences between individuals in import and export sectors as well as between traded and non-traded sectors (Hays, Ehrlich and Peinhardt 2005; Mayda and Rodrik 2005).

In summary, both sector of employment and skill level can be argued to explain some differences in trade policy preferences, although both causality and relative importance can be questioned. It has been pointed out by Scheve and Slaughter (2001) that predictions of preferences in line with the Ricardo-Viner model do not necessarily rule out that

preferences can also be shaped as predicted by the Heckscher-Ohlin model. Instead, Ricardo-Viner preferences could be seen as individuals anticipating short-run effects of trade liberalization, even in the presence of intersectoral mobility.

Furthermore, a number of non-economic factors predicting trade policy preferences have also been identified (Scheve and Slaughter 2001; O'Rourke and Sinnott 2001; Mayda and Rodrik 2005; Hays, Ehrlich and Peinhardt 2005): age, social level, gender, national identity and political ideology have all been found to explain some of the variations in support for free trade. For example, women have consistently been found to be more protectionist than men, although no reasonable explanations for either of these findings have yet been presented. Perhaps not as surprising is that individuals expressing right-wing ideologies have consistently been more supportive of free trade. Furthermore, nationalist individuals have been found to be considerably more protectionist than others. Another interesting piece of evidence is from O'Rourke and Sinnott (2001) who found that even though national mobility does not seem to have an effect on trade policy preferences, respondents who perceived themselves as *internationally* mobile were found to be more positive towards free trade.

In conclusion, trade policy attitudes have been shown to be influenced by a number of factors, economic as well as non-economic. Although the literature needs to be complemented to further shed light on the causalities between these factors and attitudes towards trade policy, it is clear that there is no unequivocal factor which can alone explain how public opinion towards trade policy is shaped. Furthermore, it is noteworthy that factors both relating to individual possibilities/risks, as well as personality traits, seem to affect how trade policy attitudes are shaped. Since our analysis focuses on the role of risk aversion in (partially) shaping these attitudes, we merely take these other possible determinants into account when choosing our control variables.

2.3 Trade Liberalization within the European Union

Research examining the factors influencing public attitudes towards the EU is to a large extent related to research on determinants of attitudes towards free trade. This is rationalised by the fact that the EU in part is a free trade project, with the internal market for free movement of capital, labour, goods and services being one of the cornerstones of the EU project. However, the EU is also a special case since an EU membership implies a lot more than just access to the internal market. Two apparent examples of this are that 17 of the 27 member states are part of the Economic and Monetary Union, and that the member states have a common EU budget which is used to redistribute funds between EU member states in a wide range of policy areas. This gives reasons to suspect that EU citizens build opinions towards the EU differently from how their general attitudes towards free trade are built.

2.3.1 EU Transfers and Embedded Liberalism

In this thesis, we argue that the combination of free trade policies between member states within the EU and the reallocation of funds through the EU budget can be seen as a

special case of embedded liberalism. In fact, certain EU funds are explicitly aimed at protecting citizens and regions harmed by the economic integration in the EU, as well as globalization more generally. For example, the European Globalisation Adjustment Fund (EGF) aims at protecting and compensating those who are negatively affected by 'global trade patterns'.

Whereas all member states contribute to the EU budget, the amounts redistributed from the EU budget to the member states vary greatly. For example, in 2009 Lithuania *received* transfers net of their annual EU fee corresponding to 5.66 % of GDP, whereas Denmark's *contribution* to the EU budget, net of transfers received, amounted to 0.39 % of GDP. In 2009 these countries had the highest and lowest net transfers in comparison to GDP, respectively.

The effectiveness of redistribution via the EU budget is frequently questioned not only by politicians in wealthier member states, but also by scholars, without consensus (Boldrin and Canova 2001; Cappelen et al. 2003; Ederveen, Groot and Nahuis 2006; Dall'erba and Le Gallo 2008). Boldrin and Canova (2001) argued that the EU regional policies do not in fact reduce economic disparities within the EU and therefore suggested that the regional and structural policies mostly serve a redistributional purpose, 'motivated by the nature of the political equilibria upon which the European Union is built'.

If net transfers indeed are motivated by a 'political equilibria' rather than by actual economic need, we wish to know the possible driving forces behind this equilibrium. A possible answer was elaborated by Carrubba (1997), who argued that transfers are used as a tool for pro-integrationist member states to smoothen the market integration process. More protectionist member states can, according to Carrubba's hypothesis, be convinced to accept market integration in return for side-payments provided through the EU budget. In essence, he challenged the view that transfers between EU member states are motivated by 'fairness', and argued instead that the reason wealthier member states accept to make payments to poorer regions is that they receive more market integration in return. He tested this hypotheses empirically and found that there is a statistically significant negative correlation between domestic EU popularity and net transfers, regardless of whether or not the country is a net contributor or a net beneficiary. Additionally, he observed a statistically significant correlation between the level of short run costs from market integration for each member state, and the level of net transfers. In other words, a member state with low domestic support for the EU that is suffering from high short-run costs of further market integration received more transfers from the EU budget, regardless of actual economic need.

These findings as well as arguments by Boldrin and Canova (2001) are interesting since they suggest that EU funds are indeed used by policymakers as a means for gaining support for market integration. If this is correct, the notion of embedded liberalism could possibly be seen as an integral part of all EU policymaking, also in cases where policies are not explicitly aimed at supporting those hurt by globalization.

2.3.2 Determinants of Public Support for the European Union

To our knowledge, nobody has studied the effect of risk aversion on individuals' attitudes towards the EU. Consequently, nor has any study examined if net transfers in the EU can attenuate this presumed negative impact of risk aversion. However, the research studying how citizens attitudes towards the EU are shaped is extensive, and within this literature two dominant approaches have been used. On one hand determinants relating to economic self-interest have been examined, and on the other, determinants relating to national and cultural identity (De Vries and Van Kersbergen 2007; Hooghe and Marks 2005; McLaren 2002; Christin 2005; Garry and Tilley 2009).

Possible economic determinants of attitudes towards the EU have been studied in different ways. For example, Eichenberg and Dalton (1993) stated that 'if the EC has promised anything, it has promised the enhancement of member states' national economic welfare', and argued that citizens' judgement of EU membership should depend on national economic performance. To test this, they investigated the correlation between EU popularity and unemployment levels, GDP growth and inflation rates in eight EU member states from 1973 to 1988. However, only inflation had a statistically significant effect. In response to this, Gabel and Whitten (1997) argued that a weakness with the approach was that objective national conditions can neither capture subnational variation in economic conditions nor can it capture perceptions of economic performance, which do not necessarily correspond to objective economic performance. They also found evidence suggesting that individuals' perceptions of EU membership seem to vary in accordance with how they perceive their own economic situation, as well as their perception of their home country's economic performance.

A large part of the literature has focused on how preferences of individuals are shaped depending on the income distribution effects of EU membership and market integration. For example, Gabel and Palmer (1995) found that support for EU membership in EU member states varies depending on individuals' differential benefits from market integration. More specifically, they found evidence suggesting that individuals' attitudes towards the EU were shaped by their respective potential benefits by EU membership, depending on occupational skills, education, wealth and intra-EU trade. Similarly, Gabel (1998) found that occupation-based economic interest affect attitudes towards EU membership—in line with the Heckscher-Ohlin theory.

However, the effects of market integration is not the only channel through which EU citizens are affected, in economic terms, by EU membership. The distribution of funds through the EU budget have been shown to have an effect on citizens' perceptions of the EU as a whole as well. For example, a positive correlation between net transfers and public support has been shown by for example Anderson and Reichert (1995). However, in the case of candidate countries, Doyle and Fidrmuc (2006) found evidence suggesting that individuals in regions that should benefit from future EU transfers were less likely to support EU membership, and argued that this suggests that individuals assign greater weight to benefits from trade liberalization than to the potential gains from EU funds.

While economic determinants do undoubtedly seem to have an effect on attitudes towards EU membership, these economic factors do not explain all of the variation in

public support. Among non-economic determinants, primarily factors relating to national and cultural identity have been shown to explain variations in individuals' opinion as well, with stronger nationalist identities correlating with more scepticism towards EU membership (McLaren 2002; Hooghe and Marks 2005; De Vries and Van Kersbergen 2007; Garry and Tilley 2009; Christin 2005). Garry and Tilley (2009) also tested how the impact of identity on attitudes towards the EU is affected by economic factors, and argued that the impact of national identity among individuals can in fact be diluted by high levels of EU transfers. Hooghe and Marks (2004) attempted to investigate the relative impact of economic and identity theories and concluded that whereas both theories do explain variation in public support for the EU, the factors relating to individuals' national identity appear to be more forceful in their impact.

3 Theoretical Model

In this section we present a simple model which illustrating how economies can be exposed to higher levels of domestic risk as a result of international trade. By employing the model below, we motivate the hypothesis that risk aversion can have an effect on trade policy preferences due to an increased domestic risk that comes with trade liberalization. This differs slightly from the hypotheses of Ehrlich and Maestas (2010) and Ehrlich and Hearn (2013), who argue that risk aversion should have an effect on policy preferences as market oriented policies always create winners and losers in society, and that the reaction of those exposed to a possible loss or gain should depend on their level of risk exposure. In order to maintain simplicity in the model, it does not capture the possibility of different preferences. However, these hypotheses are not incompatible with ours.

The main set-up of the model we present follows that of Rodrik (1998), but a more general production function is used in this thesis.

Consider an economy subject to international trade which produces three different goods: a publicly provided good, a privately provided good and an export good of fixed supply x of which all is exported at the stochastic price π. In addition to this there exists another good which is not produced at home. Assuming that trade is continuously balanced, and that π is given in terms of the import good, the economy imports a total of πx import good units.

Let λ denote the share of workers employed in the public sector—here synonymous with the size of the public sector. Treat imports πx as an intermediate good increasing the productivity of labour in the private sector, and let $f(\pi x, 1-\lambda)$ be a Cobb-Douglas production function for the private good, with at most constant marginal returns on each factor. Furthermore, let $h(\lambda)$ be a strictly increasing, strictly concave function denoting the production in the public sector. If the government chooses λ before knowing the terms of trade π, and if publicly and privately produced goods are perfect substitutes,

then its problem is to find λ according to

$$\begin{aligned} \lambda &= \arg\max_{\lambda\in[0,1]} V(\lambda), \\ V(\lambda) &\stackrel{\text{def}}{=} \mathbf{E}\left[u(h(\lambda) + f(\pi x, 1-\lambda))\right], \end{aligned} \tag{3.1}$$

where u is the utility function of a representative individual.

Assume further that $u' > 0$, $u'' < 0$ and that π has mean μ and variance σ^2. Expanding the utility function in a second order polynomial around μ yields

$$\begin{aligned} u(h(\lambda) + f(\pi x, 1-\lambda)) \approx\ & u(h(\lambda) + f(\mu x, 1-\lambda)) \\ & + \frac{du}{d\pi}(h(\lambda) + f(\mu x, 1-\lambda))(\pi - \mu) \\ & + \frac{1}{2}\frac{d^2u}{d\pi^2}(h(\lambda) + f(\mu x, 1-\lambda))(\pi-\mu)^2. \end{aligned}$$

By taking expectations the first order term disappears and one obtains

$$\begin{aligned} V(\lambda) \approx\ & u(h(\lambda) + f(\mu x, 1-\lambda)) + \frac{\sigma^2 x^2}{2} u'(h(\lambda) + f(\mu x, 1-\lambda)) \cdot \partial_{1,1}^2 f(\mu x, 1-\lambda) \\ & + \frac{\sigma^2 x^2}{2} u''(h(\lambda) + f(\mu x, 1-\lambda))(\partial_1 f(\mu x, 1-\lambda))^2, \end{aligned}$$

where ∂ denotes partial derivatives.[2] Since f is monotone and concave in its first argument, the last two terms are negative. Hence, this shows how extra trade could hurt the individual by causing additional risk. With $R \stackrel{\text{def}}{=} \sigma x$ as the measure of external risk, the first order condition of the maximisation problem (3.1) is

$$(h' - \partial_2 f)\left(u' + \frac{R^2}{2}(u''' \cdot (\partial_1 f)^2 + u'' \cdot \partial_{1,1}^2 f)\right) = \frac{R^2}{2}(2u'' \cdot \partial_1 f \cdot \partial_2 \partial_1 f + u' \cdot \partial_2 \partial_{1,1}^2 f).$$

By the assumptions on f and the additional assumption of prudence, i.e., $u''' > 0$, one concludes that the factor in the larger parentheses on the left hand side is positive and that the right hand side is negative, which forces h' to be smaller than $\partial_2 f$. This, in turn, implies that—in order to maintain an optimal allocation—the size of government increases when the country is exposed to external risk, as is more easily seen in the

[2] The vigilant reader will notice that we have imposed additional conditions u and π. The simplest form of sufficient assumption is that the density function of π has narrow enough support (depending on u and f). There are several reasonable assumptions that would justify the approximation, of which all are fairly technical. For example, if u is four times differentiable and π bounded, one can add the third order term—proportional to the third central moment—and make an upper bound on the error term proportional to the fourth central moment.

following equation:

$$(h' - \partial_2 f)u' = \frac{R^2}{2}\left(2u'' \cdot \partial_1 f \cdot \partial^2_{2,1} f + u' \cdot \partial^3_{2,1,1} f - (h' - \partial_2 f)(u''' \cdot (\partial_1 f)^2 + u'' \cdot \partial^2_{1,1} f)\right).$$

If there is no external risk, $h' - \partial_2 f = 0$, whereas if $R > 0$, $h' - \partial_2 f < 0$. Since $h' - \partial_2 f$ decreases with λ, it follows that a relatively larger public sector solves (3.1) when the economy is exposed to trade risk. An explanation for this is that, when faced with external risk, 'asset weights' are moved from the risky trade to the safe, governmental activity since there is no way to diversify the trade risk in the domestic market.

This model illustrates how an economy can be exposed to higher levels of risk due to international trade. Furthermore, it shows that the government can ease the negative effects of this through governmental spending, here interpreted as λ. As transfers from the EU can be seen as a part of the governmental spending, we will, in the sections that follow, empirically investigate whether also a supranational institution such as the EU can be an entity compensating for perceived trade risk.

4 Empirical Method

In this section the two main hypotheses are presented along with the statistical methods used to test them. Thereafter follow descriptions of the data used.

4.1 Model and Hypotheses

According to the results in section 3, the residents of a country face higher levels of risk if the country decides to engage in international trade, let it be in the EU or in any other multilateral or bilateral trade agreement. Consequently, risk averse individuals should have a higher propensity to oppose such trade. Furthermore, since states can ease individual risk through compensation of variations in consumption or through social security systems, transfers from the EU should have the same effect, either by benefiting people directly or by increasing the total governmental budget and hence also its spending. For this argument to be reasonable, we assume that EU citizens are aware of the transfers, either by noticing them or by knowing of them and their effect.

To test this, we regress the opposition to an integrated EU market on the risk aversion and the risk aversion interacted with the size of transfers per GDP, as well as control variables, according to

$$\begin{aligned}(\text{anti integrated market})_i = {} & \beta_1(\text{risk aversion})_i \\ & + \beta_2(\text{risk aversion})_i \cdot (\text{country transfers})_i + \boldsymbol{x}_i^\top \boldsymbol{\beta} + \varepsilon_i,\end{aligned} \tag{4.1}$$

where i denotes the individual, transfers is the size of transfers to the country and $\boldsymbol{x}$ is a vector of control variables identified in section 2. These are country dummies; demographic controls including education, social level, gender, age and political preferences; national

and European sense of belonging; as well as a variable controlling for Heckscher-Ohlin effects.

With this model in mind, the hypothesis that people perceive a higher degree of risk as a consequence of international trade can be formulated as

Hypothesis 4.1. *International trade induces increased risk which turns risk averse individuals' opinions against integrating the EU market. In terms of the equation above, the risk aversion enters the model with a positive coefficient.*

This yields the null hypothesis that $\beta_1 \leq 0$.

Furthermore, if people are aware of the EU transfers, or at least perceive a reduction of risk, the transfers should be able to dampen the effect of risk aversion:

Hypothesis 4.2. *Received EU transfers reduce risk and perceived risk. Hence the effect of risk aversion decreases with the size of the country's received transfers.*

The corresponding null hypothesis is formulated as $\beta_2 \geq 0$.

It is worthwhile noting that hypothesis 4.2 assumes that the transfers do actually decrease the risk, but in reality one could have to reject the null hypothesis even if this is not the case. For example, it could be that the transfers do not actually decrease the risk faced by EU citizens, but that the citizens believe otherwise. Since the effect of risk aversion only depends on the perceived risk, this scenario would lead to a rejection of the null hypothesis. However, if the transfers do not reduce risk, we argue that this should have been recognised, i.e., perceived risk reduction implies actual risk reduction. Nevertheless, this fact should have no effect on policy decisions as long as the purpose is to gain support for international trade.

4.2 Data

All survey data is primary survey data from the Eurobarometer 71.3, which means that all data points are collected during the period June–July 2009. Budget and GDP data are official data obtained from the European Commission. Additional details about the variables are given in appendix C.

First of all, sentiment against an integrated marked is modelled with a dummy indicating if the respondent answered 'Tend to disagree' to the statement that the country's economy is more stable because of being in the EU or the euro area (the statement differed among euro and non-euro member countries). The alternative reply was 'Tend to agree'. Thus, this variable differs from those mentioned above that normally have been used in research studying free trade preferences or attitudes towards the EU. The arguments justifying this are of two kinds: First, the economical motivation, as mentioned in section 2.3.2, is that the individual's perception does not correspond to the objective performance (Gabel and Whitten 1997), but arguably is biased in the direction of the individual's preferences. The other argument is of statistical nature; there is a significant correlation between this variable and the (dummy) variable indicating whether the individual finds the EU good

or bad overall.[3] However, by using the first measure instead, we are able to avoid the additional variation in the dependent variable caused by non-economic issues (and also economical ones not relative to international trade). The effect of risk aversion is tested by simply adding a risk aversion variable (which is described below) to the regression. Thereafter, the risk aversion variable is interacted with a measures of how much money is transferred to the nation, which could be soothing to the individual .

To control for Heckscher-Ohlin effects on an individual's behaviour, we measure the skill abundance by the nation's GDP and multiply it with the length of the individual's education, in line with Mayda, O'Rourke and Sinnott (2007). Due to limitations of data, the individual's age when he/she 'stopped full time education' is used to measure the length of education. The 'current' age was used for those who were still studying.

The variables used for national and European sense of belonging are the answers to the question 'Thinking about this, to what extent do you personally feel you are...', followed by the individual's country and 'Europe', respectively. There are four accepted answers on a scale from 'To a great extent' to 'Not at all'.

Two different measures of individual risk aversion are used in this thesis in order to compare the results against each other and obtain some robustness. It is first estimated from other parameters, following a procedure similar to that of Mayda, O'Rourke and Sinnott (2007). It has been established that higher levels risk aversion corresponds to wishes for more extensive social welfare systems (Alesina and Ferrara 2005). This is made use of by regressing the desire of more extensive social welfare systems on a set of other related variables and using the residuals as a measure of risk aversion. One would expect the residuals to consist of risk aversion if other effects related to preferences on the coverage of the social welfare system are extracted—the political preferences, for example. However, it should be noted that any risk aversion connected to such things as political preferences etc are unfortunately also lost, which is only of the method's main shortcomings. For details on the control variables used, see table 4.

As another measure of risk aversion, we use the answers to the question 'Regardless of whether you're actually looking for a job, which of the following would you, personally, put as your top priority?' The allowed answers are 'Good salary', 'Job security' and 'An interesting job'. A dummy is constructed to take the value 1 for those who answered 'Job security'. One would expect a risk averse person to have stronger preferences towards job security, on average. Therefore, this should to some extent measure an individual's risk aversion when controlling for social level etc.

5 Results

In this section results from the regressions outlined in section 4.1 are presented along with a discussion of their implications. As already mentioned, all data used is from the

[3] The correlation coefficient between the two variables is 0.4965. We accept this as strong enough considering that there are many other factors affecting the perception of whether the EU is good or bad that are *expected* to be included as well.

Eurobarometer, Eurostat (for GDP) and the official budget data from the European Commission.

Fitting equation (4.1) to the data, one obtains the results in table 2 on page 16. Standard linear regressions are employed, and all predicted values are contained in the interval between 0 and 1. Stars denote two-sided p-values. The results presented use the measures described in section 4.2 and are divided into 4 separate columns. Column (1) uses the risk measure as constructed by Mayda, O'Rourke and Sinnott (2007), whereas column (3) uses the wish for job security. Results from the first stage regression are presented in table 4 on page 23. In constructing this measure, we deem it necessary to control for one's political preferences in the first stage (which surprisingly has an effect that is not significantly different from zero in this regression). Because of this, observations are lost since some respondents have refused to share their preferences. We have therefore chosen not to control for political preferences in the regression corresponding to column (3). Columns (2) and (4) show regression results from the same models—(1) and (3) respectively—but using only common data points of (1) and (3). Note that this results in a loss of 8,343 observations for the second measure, largely due to missing data on political preferences.[4] Country effects are controlled for in all regressions, which makes us unable to add an extra term for net transfers per GDP due to perfect multicollinearity.

The findings in table 2 support both hypotheses. First of all, risk aversion enters with a positive coefficient, significantly different from zero. This means that individuals with higher risk aversion tend to be less supportive of an integrated EU market. Second, similar observations hold for the interaction term with net transfers, which is negative. The interpretation of this is that higher levels of net transfers reduces the coefficient of risk aversion, i.e., higher net transfers make risk averse individuals worry less about an integrated market, in line with the embedded liberalism thesis. In order to test the null hypotheses 4.1 and 4.2, the corresponding (one-sided) p-values are calculated and presented at the bottom of the table. We conclude that both null hypotheses can be rejected at conventional significance levels.

In comparing the two different measures of risk aversion, focus is put on the correspondence and discrepancy between the two sets of regressions. This is due to the nature of risk aversion which makes it difficult, if not impossible, to accurately quantify; any two measures of it are not directly comparable. For this reason the drop in magnitude of the risk aversion coefficient is not necessarily too concerning provided the interaction term changes correspondingly.

The drop does, however, call for a better measure of risk aversion since the difference indicates that one measure contains more than just risk aversion or that they do not encapsulate the same range of risk aversion among people. This is evident when assessing the economical significance of risk aversion, for which the effects differ by an order of magnitude. The two digit effect of the measure in regressions (1) and (2) is economically significant, whereas that of the others is of lesser significance. The effect of net transfers varies among countries, but is mostly of order of magnitude 0 for both measures. This

[4]For the sake of completeness, the lost sample is statistically compared to the kept sample and no significant difference is found. For more details, see appendix B.

	(1)	(2)	(3)	(4)
	Anti integrated market		Anti integrated market	
Risk aversion	0.125***	0.126***	0.0207**	0.0177
	(0.00991)	(0.00998)	(0.00780)	(0.00958)
Risk aversion · Net transfers per GDP	-2.142***	-2.121***	-0.919*	-0.998
	(0.633)	(0.638)	(0.437)	(0.572)
Social level	-0.0259***	-0.0256***	-0.0298***	-0.0246***
	(0.00260)	(0.00262)	(0.00205)	(0.00264)
Female	0.0563***	0.0565***	0.0542***	0.0574***
	(0.00756)	(0.00760)	(0.00609)	(0.00765)
Age	0.00471***	0.00507***	0.00614***	0.00503***
	(0.00131)	(0.00132)	(0.000914)	(0.00133)
Age^2	-0.0000621***	-0.0000667***	-0.0000769***	-0.0000663***
	(0.0000136)	(0.0000137)	(0.00000934)	(0.0000138)
Length of studies	-0.00528	-0.00544	-0.00762**	-0.00798*
	(0.00345)	(0.00348)	(0.00253)	(0.00346)
Length of studies · GDP	-0.407***	-0.401**	-0.259**	-0.309*
	(0.121)	(0.122)	(0.0906)	(0.121)
Sense of national belonging	-0.00182	-0.00116	-0.0117*	-0.00218
	(0.00703)	(0.00712)	(0.00559)	(0.00717)
Sense of European belonging	-0.113***	-0.113***	-0.131***	-0.118***
	(0.00482)	(0.00487)	(0.00367)	(0.00486)
Politically right wing	-0.00956***	-0.00969***		-0.0105***
	(0.00175)	(0.00176)		(0.00177)
Observations	14562	14397	22740	14397
R^2	0.166	0.167	0.163	0.157
p for null hypothesis 4.1	0.00000	0.00000	0.00399	0.03259
p for null hypothesis 4.2	0.00036	0.00045	0.01778	0.04050

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 2: Regression (1) and (2) measure risk aversion using the residuals of the first stage regression found in table 4, whereas regressions (3) and (4) use the dummy of whether or not job security is the top priority, see section 4. Regressions (2) and (4) have been constructed as to only use the common observations of regressions (1) and (3). Country effects are controlled for. The stars represent p-values for two-sided tests. For variable descriptions, see section 4.2 and appendix C.

indicates that net transfers on an aggregate level is a costly way to buy support if the effect is only to cushion risk.

6 Conclusion

In this thesis, we have conducted the first test of the embedded liberalism thesis in the context of the EU. Our findings suggest that risk aversion does in fact influence individuals' attitudes towards an integrated EU market. More precisely, risk averse individuals tend to be more negative when evaluating the economic consequences of their country's EU membership. This provides further support to the hypothesis that risk aversion affects how individuals evaluate trade policy, and is consistent with the evidence provided by Mayda, O'Rourke and Sinnott (2007), Ehrlich and Maestas (2010) and Ehrlich and Hearn (2013).

Furthermore, the results support the micro-foundations of the embedded liberalism thesis, suggesting that net transfers from the EU budget can make those citizens who worry about increased exposure to risk evaluate EU membership more positively than they otherwise would. Although we do not study the causality between knowledge of specific compensatory policies and support for free trade, as done by Ehrlich and Hearn (2013), our results indicate that in the aggregate, there seems to be a positive correlation between the levels of net transfers (in total) and perceptions of the EU. The results found by Ehrlich and Maestas (2010) even suggest that the results would be stronger if risk exposure was also taken into account.

However, it is important to note that these findings have a few limitations. First, we cannot draw any conclusions concerning the *magnitude* of the effect of risk aversion on policy preferences in practice, since we do not distinguish between individuals who are negatively and positively affected by EU market integration. Hence, we are unable to test the impact of risk aversion based on the individual risk exposure, as proposed by Ehrlich and Maestas (2010), but instead do this on an aggregate level. Additional complications relating to the magnitude are also caused by the difficulty in quantifying risk aversion, as commented in earlier sections. We simply note that, at an aggregate level, risk aversion does seem to affect the public opinion negatively, and net transfers seem to slightly moderate this negative effect.

Second, due to the nature of the dependent variable used in this paper, we must be careful in drawing conclusions on the degree to which risk aversion impacts the overall evaluation of EU membership. The reason for this is that EU membership could possibly cushion or cause additional, non-economic risk (depending on the individual's preferences) which would then affect the importance of risk aversion.

Nevertheless, apart from a small number of recent papers, risk aversion has been largely ignored when studying how individuals' shape their policy preferences. Therefore, we believe that incorporating and expanding the idea of risk aversion as an explanatory factor in future research on public opinion could yield prosperous outcomes. For example, studying the relative effects of specific EU programs and policies, rather than the total level of net transfers, should be interesting from a policy perspective.

On a last note, we pose the open question of whether a negative effect of risk and risk aversion on trade policy attitudes can be moderated not only by monetary compensation, but also by other phenomenon or policies. For example, if individuals who consider themselves internationally mobile tend to be more positive towards trade, as suggested by O'Rourke and Sinnott (2001), there may be other policy tools that can cushion a negative effect of risk aversion on trade policy preferences. For instance, student exchange programs, as already managed by the EU, could arguably have such an effect. Unfortunately, we have been unable to study this here due to a lack of relevant variables, but wish to see such studies in the future.

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A Supplementary Calculations

For the sake of completeness, calculations of derivatives of the Cobb-Douglas function used in section 3 are carried out here. First of all, let f be a Cobb-Douglas with at most linear marginal returns in each factor:

$$\begin{aligned} f : (0,\infty) \times (0,\infty) &\to (0,\infty), \\ (x,y) &\mapsto a x^{\alpha} y^{\beta}, \end{aligned}$$

and $0 < \alpha, \beta \leq 1$. It follows that

$$\begin{aligned} \partial_x f(x,y) = a\alpha x^{\alpha-1} y^{\beta} > 0, \qquad & \partial^2_{x,x} f(x,y) = a\alpha(\alpha-1) x^{\alpha-2} y^{\beta} \leq 0, \\ \partial^2_{x,y} f(x,y) = a\alpha\beta x^{\alpha-1} y^{\beta-1} > 0 \quad \text{and} \quad & \partial^3_{x,x,y} f(x,y) = a\alpha(\alpha-1) x^{\alpha-2} y^{\beta-1} \leq 0. \end{aligned}$$

Thanks to the form of f, one obtains the same inequalities also when replacing x by y and vice verse.

B Analysis of Lost Sample

We wish to determine whether there is a difference between the samples in regressions (3) and (4). In other words, we wish to test the null hypothesis that the coefficients of the two risk aversion terms are equal in the kept and lost samples. Let $\beta_j^{(4)}$ denote the coefficients from regression (4) and $\beta_j^{(-)}$ the coefficients obtained from running the regression on the lost observations. The null hypotheses can then be stated as follows.

Hypothesis B.1. H_0^1*:* $\beta_1^{(4)} = \beta_1^{(-)}$.

Hypothesis B.2. H_0^2*:* $\beta_2^{(4)} = \beta_2^{(-)}$.

For the sake of the analysis we will assume that the lost observations are independent

of the kept ones and employ Welch's test. Then, approximately,

$$\frac{\hat{\beta}_j^{(4)} - \hat{\beta}_j^{(-)}}{\sqrt{\widehat{\mathrm{Var}}\left(\hat{\beta}_j^{(4)}\right) + \widehat{\mathrm{Var}}\left(\hat{\beta}_j^{(-)}\right)}} \sim t_{df},$$

with

$$df = \frac{\left(\widehat{\mathrm{Var}}\left(\hat{\beta}_j^{(4)}\right) + \widehat{\mathrm{Var}}\left(\hat{\beta}_j^{(-)}\right)\right)^2}{\frac{\widehat{\mathrm{Var}}\left(\hat{\beta}_j^{(4)}\right)^2}{df_{(4)}} + \frac{\widehat{\mathrm{Var}}\left(\hat{\beta}_j^{(-)}\right)^2}{df_{(-)}}}$$

according to the Welch–Satterthwaite equation. The regression results from both regressions are presented in table 5. As shown, the hypotheses cannot be discarded at any satisfactory significance level.

C Variable Descriptions

Variable	Description	Mean	Std. Dev.	Min.	Max.	N
Anti integrated market	Dummy indicating disagreement to the statement 'I feel we are more stable economically because [OUR COUNTRY] is a member of the [EU/euro area]'.	0.453	0.498	0	1	24580
Risk aversion (1) (2)	Risk aversion of regressions (1) and (2). See section 4.2 for details.	0	0.467	-1.017	1.348	15401
Risk aversion (3) (4)	Risk aversion of regressions (3) and (4). See section 4.2 for details.	0.465	0.499	0	1	25983
Net transfers	Net transfers from EU per GDP.	0.01	0.015	-0.004	0.057	26830
Female	Dummy indicating gender of respondent.	0.554	0.497	0	1	26830
Age	Age at the time of inquiry.	48.127	18.183	15	98	26830
Length of studies	Age when the respondent 'stopped full time education'. The 'current' age for those who were still studying.	5.135	2.734	0	9	26342
GDP	GDP 2009 in thousand €.	510260	697966	5972.5	2374500	26830
Sense of national belonging	Question: '...to what extent do you personally feel you are [NATIONALITY]'. Answers: 1.5 'To a great extent'; 0.5 'Somewhat'; -0.5 'Not really'; -1.5 'Not at all'.	1.264	0.572	-1.5	1.5	26677
Sense of European belonging	Question: '...to what extent do you personally feel you are European'. Answers as above.	0.521	0.882	-1.5	1.5	26522

Variable	Description	Mean	Std. Dev.	Min.	Max.	N
Social level	Question: 'On the following scale, step '1' corresponds to "the lowest level in the society"; step '10' corresponds to "the highest level in the society". Could you tell me on which step you would place yourself?' Scale of unit increments.	5.415	1.65	1	10	25883
Politically right wing	Question: 'In political matters people talk of "the left" and "the right". How would you place your views on this scale?' Discrete answers with unit increments.	-0.094	2.251	-4.5	4.5	20967
Not enough social welfare coverage	Dummy indicating disagreement to the statement 'Your social welfare system provides wide enough coverage'.	0.506	0.5	0	1	25340
Difficulty paying bills	Question: 'During the last twelve months, would you say you had difficulties to pay your bills at the end of the month...?' Answers: 2 'Most of the time'; 1 'From time to time'; 0 'Almost never/never'	0.568	0.717	0	2	26286
Personal job situation	How the respondent judges the personal job situation. Unit increments from 'Very good' to 'Very bad'.	0.226	0.894	-1.5	1.5	21038

D Additional Tables

	(1) Not enough social welfare coverage
Social level	-0.0122***
	(0.00271)
Female	0.0382***
	(0.00755)
Age	0.00446***
	(0.00129)
Age^2	-0.0000444***
	(0.0000134)
Politically right wing	0.00270
	(0.00174)
Length of studies	0.0449***
	(0.00190)
Length of studies·GDP	-1.712***
	(0.0462)
Difficulty paying bills	0.0240***
	(0.00654)
Personal job situation	-0.0192***
	(0.00571)
Personal financial situation	-0.0497***
	(0.00730)
Observations	15401
R^2	0.127

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4: First stage regression for regressions (1) and (2) of table 2. For variable descriptions, see section 4.2 and appendix C.

	(4)	(–)
	Anti integrated market	
Risk aversion	0.0177	0.0270*
	(0.00958)	(0.0135)
Risk aversion · Net transfers per GDP	-0.998	-0.889
	(0.572)	(0.684)
Social level	-0.0246***	-0.0336***
	(0.00264)	(0.00333)
Female	0.0574***	0.0419***
	(0.00765)	(0.0101)
Age	0.00503***	0.00848***
	(0.00133)	(0.00136)
Age^2	-0.0000663***	-0.000101***
	(0.0000138)	(0.0000138)
Length of studies	-0.00798*	-0.00459
	(0.00346)	(0.00385)
Length of studies · GDP	-0.309*	-0.231
	(0.121)	(0.147)
Sense of national belonging	-0.00218	-0.0244**
	(0.00717)	(0.00898)
Sense of European belonging	-0.118***	-0.147***
	(0.00486)	(0.00562)
Politically right wing	-0.0105***	
	(0.00177)	
Observations	14397	8343
Degrees of freedom	14359	8306
p-value for hypothesis B.1		0.285
p-value for hypothesis B.2		0.451

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5: Regression results used to compare the sample difference between regressions (3) and (4). For variable descriptions, see section 4.2 and appendix C.

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