

Understanding Protectionism: Happiness and the Welfare Consequences of Trade

Track: 1. Transnational firms, markets and institutions

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Abstract

Free trade is known, both theoretically and empirically, to have winners as well as losers. Studies of the welfare consequences of trade have sought to understand how trade affects individuals' welfare through studies of people's trade policy preferences and demand for protectionism. We seek to move beyond such indirect welfare assessments and propose a novel, more direct approach that draws on steady advances in happiness economics. Our method revolves around estimating heterogeneous happiness or subjective well-being (SWB) functions, which allow a variety of individual characteristics, including skill level, income level and occupational exposure to international trade to moderate the happiness effect of country-level trade openness. Results show that trade openness has a positive impact on SWB. In addition, the happiness of high-skilled workers tends to benefit much more from trade openness than does the happiness of low-skilled workers. Results are robust to a broad set of robustness checks, including using alternative measures of trade openness and subjective well-being. Implications of our findings are discussed.

Keywords: Globalization, free trade, redistribution, protectionism, happiness, unskilled, subjective well-being

1. INTRODUCTION

How do globalization and trade affect individuals? Is free trade really beneficial to everyone? Why do some people prefer trade protection while others oppose it? And what can public policy-makers learn from the trade policy preferences of individuals? The above questions are some of the thorniest questions regarding trade and international business. Many previous papers could give an answer to these questions to some extent through both empirical and theoretical studies. According to the prior literature, how trade affects the income and welfare of individuals will determine the individuals' preferences over trade policy, which will further determine the trade policy outcome. However, is global trade really supported by everyone? The answer is no. Naomi Klein with her well-known book "No Logo" and Ignacio Ramonet, an editorial director of French monthly paper "Le Monde Diplomatique", have advocated anti-globalization. As trade protection policy does not seem to be embraced by everyone, the recent literature focuses on whether the theoretical predictions of who gains and who loses from trade protection are consistent with individuals' reported trade preferences. In trying to analyze this question, researchers basically work on the impact trade might have on the within-country income distribution, either through factor line or through industry line. The former predicts that the comparatively abundant factor will gain from the trade while the scarce factor will face a decrease in real income. Support for this view can be found in the literature by Beaulieu (1996, 2002a), Balistreri (1997), and Scheve and Slaughter (2001). The latter argues that all factors employed in an industry with a comparative disadvantage will lose from the trade. Papers by Magee (1978) and Irwin (1994, 1996) provide the empirical evidence for this line. There is also some literature which supports both sides, such as Mayda and Rodrik (2005) and Magee (2001).

A large amount of related literature on individual perception in terms of trade policy uses a narrow definition of the dependent variable, namely trade preferences. Nevertheless, when analyzing the welfare consequences of trade, this variable seems to only indirectly explain individual attitudes with respect to trade because what the individuals actually perceive from the trade policy might be different from their initial preferences. Thus, some studies shift the attention towards a broader way of measuring subjective well-being. They use the individual happiness or life satisfaction gathered from surveys to analyze the economic factors. A major stream that might be weakly related to this topic deals with the well-known “Easterlin paradox”, which analyze the income level and happiness (i.e. Easterlin 1974, 2001; Di Tella and MacCulloch 2008; Stevenson and Wolfers 2008). Other examples of happiness studies measure inflation and unemployment (Di Tella and MacCulloch 2001, 2005; Pretino 2001), and institutions (Veenhoven 2000; Frey and Stutzer 2006). Nevertheless, there are only a limited number of papers which directly use the happiness data to measure trade openness. Even among the papers regarding this topic, most do not give any explanations about the way in which effect differs among different groups. Thus, the relevance and originality of this paper lies in two aspects: first, the starting point is to analyze the welfare consequences of trade openness by using happiness data in order to better capture the individual perception of trade policy; second, this paper will measure this relationship between different groups, both through factor line and industry line. Special attention will be given to the individual trade exposure. Furthermore, by using the data from Euro-Barometer Survey Series, this paper analyzes the effects across 30 European countries from 2002 to 2010.

The rest of the paper is organized in four additional sections. Section 2 provides a brief review of the relevant literature as well as the hypotheses. Section 3 will discuss the data and the methodological issues. The main results and robustness checks will be presented in Section 4. Finally, Section 5 will demonstrate the

conclusion, limitations and potential direction for further research.

2. BACKGROUND AND HYPOTHESES

Among a large quantity of literature about trade, this article is particularly related to work focusing on the welfare consequences of trade and preferences about trade policy. Ricardo (1817) mentions that foreign trade can “increase the mass of commodities and therefore the sum of enjoyments” by exploring the comparative advantage. He argues that foreign trade is beneficial to a country because it increases the amount and variety of goods, and it provides cheaper commodities. Furthermore, according to standard trade theory, the whole society gains from the trade. However, empirical researches yield various results depending on how trade openness is actually perceived by individuals. One paper that explicitly provides evidence for the link between trade and individual happiness is one by Di Tella and MacCulloch (2008). It indicates a negative relationship between trade openness and happiness by controlling for income level, but this is only significant at 8%. They argue that the negative relationship is mainly due to the fact that trade flows are related with risk and exposure to external shocks including job loss. On the contrary, Bjørnskov et al. (2008) reveal a positive relationship between trade openness and life satisfaction. Hessami (2011) finds that globalization will increase life satisfaction as reported in the 2001 Euro-barometer survey of the EU-15. Generally, there are only a few papers which actually measure how trade openness influences the individual happiness. Although some papers are related to this topic, they use the broader measure of globalization index rather than trade openness. Therefore, the first step of this paper is to study the welfare consequences of trade for the society as a whole by directly using trade openness and happiness data. It can be argued that trade has a net benefit for

the whole society as it can increase the amount and varieties of the goods, provides the abundance and cheapness of commodities and allows flexible labor mobility. The first hypothesis is therefore:

Hypothesis 1: *Trade openness has a positive effect on individuals' happiness.*

Although trade might be beneficial to the society as a whole, not everybody will enjoy the fruits of the trade due to the redistributive effects within the societies. Hence, some groups of people may support the trade while others oppose it. Recent empirical literature on explaining the preferences for trade policy focuses largely on the impact of globalization might have on a country's income distribution. The preferences are dependent on how trade policy influences income for factors of production which is a vital determinant of individual welfare. The effect of trade depends on the degree of intersectoral factor mobility. In the specific-factor model or Ricardo-Viner (RV) framework, if all factors are immobile between sectors, then the industry of employment will determine how their income varies with trade and their resulting trade preferences. Studies that have found in favor of this model include Magee (1978), Irwin (1994, 1996). Magee (1978) suggests that political lobbying activity is organized through industry line rather than factor line. In addition, Irwin (1994, 1996) compares both the impacts of occupational structure and class structure of the electorate on the 1906 and 1923 British general election. By analyzing the voting patterns, he finds the specific-factor model better supports the evidence than those making factor mobility assumptions.

On the contrary, in the factor endowments model or Heckscher-Ohlin (HO) framework, as factors are assumed to be mobile across sectors, factor income varies by factor type such as skill. Studies such as Beaulieu (1996, 2002a), Balistreri (1997), Kaempfer and Marks (1993) and Scheve and Slaughter (2001)

support this model. According to Beaulieu (1996, 2002a), factors of production are found to be major determinants of American preference for trade policy. Balistreri (1997) offers evidence that preferences on the FTA are distributed along factor lines as indicated by the HO framework. Kaempfer and Marks (1993) reveals the fact that House votes are significantly correlated with the average wage in House districts. Scheve and Slaughter (2001) report that individual preference towards trade policy is determined through factor line by analyzing individual-level survey data on American opinions about generic trade policy. They suggest low skilled labor is strongly correlated with support for trade protectionism and there is relatively high intersectoral labor mobility in the U.S.

Moreover, except two polar opposite sides, some studies stand in the middle and support both models. Beaulieu and Magee (2001) find that both the industry and the factor influence the pattern of the supporters of NAFTA and GATT in the U.S. Beaulieu (2002b) also contends that not only factors of production but also the industry of employment help determine the preference on trade policy based on American congressional voting patterns. Mayda and Rodrik (2005) argue that pro-trade preferences are significantly correlated with an individual's level of human capital as in the HO model while preferences over trade are also correlated with trade exposure of the sector in which an individual is employed.

The papers described above mainly look at the issue from the supply side, but other studies look at it from the perspective of the consumer. Baker (2003, 2005) argues that consumption-based interests also matter a lot. The evidence indicates that consumption concerns will boost the aggregate support for free trade: for example, consumers concern about how trade policy could improve the quality, price and variety of goods available to them.

According to the prior literature, within the society some groups of people gain from the trade while

others lose from it. By focusing on the supply side, the next step is to study the relationship between trade openness and individual happiness among different groups. This paper will focus on both the factor line and industry line. There are two ways to distinguish the groups through factor types, by using occupational-based skills or educational-based skills, as shown in the papers of Scheve and Slaughter (2001), Blonigen (2011) and Mayda and Rodrik (2005). They find that the preferences over trade policy differ between high-skilled and low-skilled labors. Low-skilled labor prefers trade protectionism while high-skilled labor is in favor of free trade. For European countries, high-skilled workers are considered to have a comparative advantage than low-skilled workers. Therefore, they tend to support free trade and in turn free trade will make them feel much happier than low-skilled workers. This leads to the second hypothesis:

Hypothesis 2: The relationship between trade openness and happiness is different for high-skilled and low-skilled workers, with high-skilled workers gaining more happiness from trade openness than low-skilled workers do.

The second way to classify the groups is according to the industry of employment. Industry trade exposure is often used as a measure like in the paper by Scheve and Slaughter (2001) and Blonigen (2011). Mayda and Rodrik (2005) find that as workers in the non-traded sectors are more likely to benefit from trade, they tend to be the most pro-trade. Thus, workers in non-tradable sectors may feel much happier with the trade openness. The third hypothesis is:

Hypothesis 3: The relationship between trade openness and happiness is different for workers in tradable

and non-tradable sectors, with workers in non-tradable sectors gaining more happiness from trade openness than workers in tradable sectors do.

3. DATA AND METHOD

3.1. Description of data

The main data used in this paper is from the European Social Survey (ESS), which is currently directed by a Core Scientific Team led by Rory Fitzgerald. This dataset aims to explain the interaction between Europe's changing institutions and people's attitudes, beliefs, and behavior patterns. Since 2001, the ESS has surveyed respondents from more than 30 European nations and covered 5 time waves (e.g. 2002/04/06/08/10). The ESS dataset has the advantage that detailed data on people's education and income, both of which are important variables used in this paper, are available. The website of ESS provides more information and public access to the data files (European Social Survey 2010)¹. In addition, data on trade and trade openness and trade freedom index come from World Bank and OECD Stat Extracts. and Heritage Foundation. To supplement this data further, data on country-level factors that potentially affect individual well-being are chosen from a variety of sources, i.e., World Bank Governance Indicators and World Development Indicators (World Bank 2012a, 2012b), and Worldwide Governance Indicators (WGI). To sum up, the research sample of this paper covers 30 European countries covering five time waves (e.g. 2002/04/06/08/10). A complete list of the countries included in each wave of the ESS is available on request.

3.1.1. *Dependent variable*

The dependent variable of subjective well-being comes from the ESS 2010. There are basically two general measures of subjective well-being in this survey, namely “*Happiness*” and “*Satisfaction with life*”. This paper will use “*Satisfaction with life (SWL)*” as a dependent variable and use “*Happiness*” for robustness checks. *SWL* is a 0 to 10 scale with a survey question “All things considered, how satisfied are you with your life as a whole nowadays?” where 0 suggests extremely dissatisfied and 10 indicates extremely satisfied. Similarly, “*Happiness*” is also a 0 to 10 scale based on a survey question “Taking all things together, how happy would you say you are?”, where 0 indicates extremely unhappy and 10 means extremely happy. Both measures in this survey are at the individual level.

3.1.2. *Key independent variables*

Aiming to test Hypothesis 1, the first independent variable is the level of *Trade Openness* for each country, which examines the actual trade flows. This variable is calculated by the total trade relative to GDP that is $(\text{export} + \text{import})/\text{GDP}$. The data comes from the World Bank. In addition, apart from the traditional trade openness indicator which captures the actual trade flows, *Trade Freedom* can also be an alternative measure which stresses more on the option value of trade. The data is driven from Heritage Foundation. Heritage Foundation uses trade freedom index to measure how countries score in terms of the absence of tariff and non-tariff barriers with respect to imports and exports of goods and services. *Trade Freedom* will be used for robustness checks.

The second independent variable is to test the individual’s skill level. This paper will apply two measures to study this moderating variable about its effect on how much or how little a person benefits from

trade. Like the most of prior papers (Scheve and Slaughter 2001; Mayda and Rodrik 2005), years of education and occupation wage are two ways to measure skill level. However, Blonigen (2011) finds that only years of education shows a robust correlation between labor markets attributes and trade policy preferences for US survey data. Thus, education-based and occupation-based skills might have different effect. This paper will use both education-based and occupation-based skill indicators as the independent variable for the analysis. *Years of Education* are directly asked of respondents in the ESS across all survey years. For occupation-based measure, *Relative Income Rank* is constructed by calculating the ratio of each individual's income rank relative to the total number of income rank over all observations. The ESS has asked the respondents to identify their total income by selecting one income interval. In total, there are 12 intervals and each choice includes weekly, monthly and annually income. For example, the first interval includes the income range that "J. Approximate weekly: less than €40; Approximate monthly: less than €150; Approximate annually: less than €1800". Then, each individual is ranked according to their income interval. Finally, *Relative Income Rank* can be constructed by using the individual's income rank.

The second moderator is to measure the extent of whether the industry is tradable or not, namely Industry Trade exposure (ITE). To construct this measure, this paper follows the commonly accepted assumption that industries with a comparative advantage will export the products while industries with a comparative disadvantage will be better to rely on the domestic markets. The revealed comparative advantage is calculated by using Balassa index. As the ESS asks respondents to identify the industry they work in, data on individuals' industry (NACE code) is available and classified into 99 types. The data for trade flows (exports for each industry) are obtained from STAN database on OECD. Stat Extracts. STAN uses a standard industry list for all countries (ISIC code) which is concordant to NACE code. Non-traded sectors are assigned

a net export share of zero. A more detailed description of the construction of this variable is available on request.

3.1.3. Control variables

Since the data used in this paper are at both the country level and individual level, country variables as well as individual variables are needed to control for the model. The ESS includes different items about respondents' background such as gender and health. Following many of the papers concerning happiness data (e.g. Alesina et al 2004; Pacek and Radcliff 2008; Di Tella and MacCulloch 2008; Álvarez-Díaz et al 2010), individual-level control variables in the analysis include age, age-squared (to account for curvilinear relationship between age and happiness) , gender(1=male), marital status (Married, Separated, Divorced, Widowed, or Never married), and health (1= "very bad", 2= "bad", 3= "fair", 4= "good" or 5= "very good"). All data are chosen from the ESS. Individuals with the answers of "Not applicable", "Refusal", "Don't know", and "No answer" are excluded.

For country-level control variables that might affect individual happiness, unemployment rate, and government spending will be used in the analysis (e.g. Di Tella et al 2001; Di Tella and MacCulloch 2008; Pacek& Radcliff 2008). For instance, the higher the unemployment rate is, the less happiness people have. Larger government spending tends to result in a lower individual happiness. These data come from World Bank Governance Indicators and World Development Indicators (World Bank 2012a, 2012b). Furthermore, the study by Álvarez-Díaz et al (2010) reveals that the quality of government significantly affects subjective well-being. The Worldwide Governance Indicator Dataset provides the aggregate indicators for six dimensions of governance from 1996 till 2011. Since six dimensions are highly correlated, government

effectiveness is selected to represent the quality of government. This indicator reflects the quality of public and the civil services, the degree of its independence from political pressures, the credibility of the government commitment, and the quality of policy formulation and implementation. It ranges from -2.5 (very weak) to 2.5 (very strong).

To conclude, for the basic model, this study ends up with 235, 825 individuals from 30 European countries over 2002 to 2010. A short description and some summary statistics of the variables used in this paper are available on request. For robustness checks, the alternative measures of subjective well-being and trade openness will be analyzed.

3.2. Method and empirical model

As one important feature of the ESS data is that they are structured hierarchically with individual observations nested in countries, this paper will thus apply multilevel modeling (e.g. Snijders and Bosker 1999; Gelman and Hill 2007). Multilevel Modeling is more preferable than traditional regression techniques because this method can distinguish the individual and aggregate correlates of individual happiness and model them simultaneously. Second, it takes into account the clustering of observations. As individuals within countries are not independent, the standard errors from traditional regression may be underestimated (Moulton 1986, 1990; Wooldridge 2003). In addition, one essential aim of this paper is to study the interaction between the level of trade openness and the moderator variables. The multilevel model is well-suited for analyzing cross-level interactions.

According to the above information, this model will have two levels, an individual i (Level 1) residing in country j (Level 2). SWB_{ij} denotes the individual's well-being. The independent variables are the level of

trade openness T_j , years of education E_{ij} and industry trade exposure ITX_{ij} . $MICRO_{ij}$ represents individual-level control variables while $MACRO_{ij}$ means the set of country-level variables. This yields the following level-1, within-country model:

$$SWB_{ij} = \beta_{0j} + \beta_{1j} * E_{ij} + \beta_{2j} * ITE_{ij} + \beta_{3j} * MICRO_{ij} + \varepsilon_{ij}$$

Similarly, the level-2, between-country model is given by:

$$\beta_{0j} = \gamma_{00} + \gamma_{01} * T_j + \gamma_{02} * MACRO_j + u_{0j}$$

$$\beta_{1j} = \gamma_{10} + \gamma_{11} * T_j + u_{1j}$$

$$\beta_{2j} = \gamma_{20} + \gamma_{21} * T_j + u_{2j}$$

When combining the above two models, the complete model is shown below:

$$SWB_{ij} = \gamma_{00} + \gamma_{01} * T_j + \gamma_{02} * MACRO_j + \gamma_{10} * E_{ij} + \gamma_{11} * T_j * E_{ij} + \gamma_{20} * ITE_{ij} + \gamma_{21} * T_j * ITE_{ij} + \beta_{3j} * MICRO_{ij} + [u_{0j} + u_{1j} * E_{ij} + u_{2j} * ITE_{ij} + \varepsilon_{ij}]$$

To test the hypotheses, two interaction terms are included: $T_j * E_{ij}$ and $T_j * ITE_{ij}$. The coefficients of γ_{01} , γ_{11} , and γ_{21} are the main aspects of the model to look at in the results. The terms u_{0j} to u_{2j} capture the deviations at the country-level. γ_{00} is the constant of the model. Thus, the model is a random-intercepts, random-slopes model. The terms in square brackets constitute the random part of the complete model while the other terms represent the fixed part. The model is estimated by using maximum likelihood.

4. EMPIRICAL RESULTS

4.1. Baseline results

First, hypothesis 1 is tested, investigating the impact of trade openness on life satisfaction. According to Table 1, Model 1 and Model 3 are the basic models for testing the hypothesis. The only difference between Model 1 and 3 is that Model 3 includes all the control variables. Model 1 shows that, in accordance with the literature, trade openness has a significant and positive impact on life satisfaction (significantly at the 0.01 level). According to Model 3, the result is robust when controlling other micro and macro variables. The estimated coefficient of trade openness is 0.150 at the critical level 0.01. Furthermore, all other control variables are significant at 0.05. As a result, trade openness positively influences subjective well-being.

Model 2 and 4 are to test the second hypothesis by adding the interaction term between trade openness and education-based skill level. Model 4 is the complete model when including the other control variables. According to the result of Model 2, even though the effect of trade openness on individual happiness and the interaction term are correctly signed, they are not statistically significant. Years of education positively affects individual happiness and is significant at 0.01. When adding the other control variables, the influence of trade openness has a positive estimated coefficient, significantly at 0.01. The interaction term has a correct sign but still insignificantly. Years of education has a strong influence on life satisfaction as in Model 2. In addition, all the other control variables significantly affect life satisfaction. Thus, years of education seems to have no significant impact on the relationship between trade openness and life satisfaction. Besides, the impact of

trade openness tends to decline when adding the interaction term in the case of without controls.

Comparing the model with and without control variables, the -2Loglikelihood decreases after controlling both individual-level and country-level variables. -2Loglikelihood also reduces when adding the moderating variable due to an improved model fit. The model with control variables and moderating variables are hence better fitted with the sample data.

<< Insert Table 1 about here >>

The alternative way to measure skill level is to use occupation-based skill indicator. Model 5 and 6 analyze the hypothesis 2 by using relative income rank, instead of years of education. According to the results of Model 5, without controlling other variables, the interaction term between trade openness and relative income rank is significant at 0.01 with a positively estimated coefficient, approximately 0.016. Trade openness indicates an insignificant impact on life satisfaction while relative income rank has a significantly positive influence. As shown in Model 6, the positive and significant impact of the interaction term is robust after adding other control variables. In accordance to the results of in Model 5, income rank still holds a positive sign, significantly at 0.01. However, the impact of trade openness on life satisfaction is marginally significant after controlling other variables in Model 6. In addition, other control variables give a significant influence as in the previous models. From the results of Model 5 and 6, consistent with the hypothesis 2, relative income rank positively affects the relationship between trade openness and life satisfaction. Compared the number of -2Loglikelihood, the model with the controls indicates a better model fit. Therefore, individuals with a higher relative income rank tend to feel happier with the trade.

<< Insert Table 2 about here >>

Therefore, from the above results, without adding the interaction term, trade openness has a significantly positive impact on subjective well-being. However, upon including the interaction term, it is found that this impact tends to decline. Furthermore, only occupation-based skill demonstrates a significant impact on the relationship between trade openness and subjective well-being. High-skilled workers tend to feel happier with trade openness than low-skilled workers. In general, according to the above results, both hypothesis 1 and 2 are supported.

4.2. Results for individual trade exposure

Table 3 indicates the results for the difference between tradable and non-tradable sectors. Model 7 excludes the controls while Model 8 includes them. In both cases, trade openness is significant with a positive sign. ITE negatively affects SWB in Model 7 and Model 8, statistically significantly at 0.05 and 0.1, respectively. Moreover, although the interaction term between ITE and trade openness shows a correct sign, it is insignificant in two cases. Hence, the impact of trade openness on the life satisfaction does not significantly distinguish between tradable and non-tradable sectors. The third hypothesis is rejected.

<< Insert Table 3 about here >>

4.3. Robustness checks

In addition to the main analysis, this study also conducted several robustness checks for the results. The first is to use the “happiness” instead of life satisfaction to represent subjective well-being. According to Model 9, without adding moderating variable, result is consistent to the Model 3 which uses life satisfaction as a dependent variable. Trade openness significantly affects the individual happiness with a positive sign. Model 10 reports the results when using years of education as the moderating variable. Compared with the results in Model 4, in this case the interaction term between trade openness and education has a positive impact which is significant at 0.05. Years of education positively affects the individual happiness while trade openness has no significant influence. Moreover, the results of Model 11, which uses relative income rank to represent the skill level, have the same results as in Model 6. Consequently, when using individual happiness as a dependent variable, trade openness reveals a positive impact on it but this effect tends to be weakened when adding the moderating variable. Occupation-based skill level positively influences the relationship between trade openness and subjective well-being. Results from main analysis are robust when changing the measure of subjective well-being. In addition, unlike using life satisfaction, education-based skill gives a significant result in the case of using the individual happiness to measure subjective well-being.

<< Insert Table 4 about here >>

For the industry line, the results are similar to those in Model 8. The impact of the trade openness is robust in this case. ITE negatively affects SWB, significantly at 0.1. The interaction term finds no significant impact on the SWB, as indicated in Model 7 and 8.

<< Insert Table 5 about here >>

The second robustness check is to use trade freedom index rather than traditional trade openness indicator of the actual trade flows. The results of Model 13 are the same as the Model 3, which presents a significantly positive impact on life satisfaction. Compared with Model 4, Model 14 presents similar results that the years of education has no significant effect on the relationship between trade openness and life satisfaction. Model 15 reveals a positive moderating impact of relative income rank, as indicated in Model 6. Thus, results after changing the measure of trade openness match with the results from main analysis. Trade openness positively relates to life satisfaction. Only occupation-based skill level is strongly correlated with the relationship between trade openness and life satisfaction.

<< Insert Table 6 about here >>

On the industry line, by changing the measure of the main independent variable, the results do not change much. Trade freedom has a significantly positive influence on SWB. In this case, both ITE and the interaction term show no significant impact. Therefore, both the main results and robustness check reveal that the impact of trade openness or trade freedom on SWB does not vary according to the sector's revealed comparative advantage.

<< Insert Table 7 about here >>

5. DISCUSSION AND CONCLUSION

Motivated by previous literature, this paper intends to relate free trade to subjective well-being and study how this relationship differs according to different individual moderating effects. The paper mainly focuses on 30 European countries from 2002 to 2010. The multilevel model is used to examine the data. Robustness checks of dependent and independent variables are conducted. Results confirm the first hypothesis that trade openness positively influences individual happiness. However, this result tends to decline when adding other individual moderating variables in some cases. In addition, the second hypothesis is also supported. The effect of trade openness on individual happiness differs according to different skill levels. High-skilled workers tend to feel happier with free trade than low-skilled workers in European countries. Special attention needs to be given to the different measures of skill level. Education-based and occupation-based skills have different results. Only occupation-based skills indicate a robust and positive impact while education-based skills only show significant results in terms of using individual happiness as the dependent variable. Besides, according to the data, this relationship does not change much in terms of the tradable or non-tradable sectors

Concerning the limitations of the study, the first is that sample countries are limited to European countries due to the availability of data. This may cause the lack of variation and thus insignificant results. It can be further improved if more countries are included which allows a larger variation. Second, this study does not include many control variables at the country level due to the concern about the endogeneity problem with the respect of trade openness. For instance, inflation might affect individual happiness through trade openness. More effective control variables at the country level can be added in the future study.

Moreover, as the significant result does not find in industry line, this is may be due to the different measure.

In this study, we use the revealed comparative advantage to represent the degree of the tradable and non-tradable sectors. We believe that sectors with a comparative advantage will export while sectors with a comparative disadvantage will not export. If data is available, other alternative measures could be sector tariff or sector net export of output (cf. Blonigen, 2010).

To sum up, results of this study imply that even though trade has a net benefit to the whole society, not everyone feels happy with trade openness. High-skilled workers tend to feel happier with the trade than low-skilled workers. Governments need to pay more attention to the low-skilled workers when implementing the policies to encourage global trade. In addition, future research is worth on the extension of the study, such as including more sample countries, other control variables or the study on the industry line.

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Table 1 Life satisfaction, trade openness and years of education

	Model 1	Model 2	Model 3	Model 4
Intercept	6.72*** (.183)	6.75*** (.178)	8.76*** (.146)	8.83*** (.142)
Trade Openness	0.150*** (.0583)	.034 (.058)	.281*** (.066)	.218*** (.066)
Years of Education	-	.059*** (.009)	-	.037*** (.007)
Interaction				
Trade Openness* Years of Education	-	.007 (.009)	-	.014 (.009)
Level 1 Control Variables				
Gender	-	-	-.103*** (.009)	-.112*** (.009)
Age	-	-	-5.33*** (.126)	-5.94*** (.129)
Age ²	-	-	6.08*** (.126)	6.88*** (.130)
Married	-	-	.441*** (.018)	.448*** (.018)
Separated	-	-	-.489*** (.058)	-.480*** (.058)
Divorced	-	-	-.207*** (.031)	-.213*** (.031)
Widowed	-	-	-.057** (.028)	-.038*** (.029)
Never Married	-	-	0 ^b	0 ^b
Health (=1)	-	-	-3.42*** (.036)	-3.28*** (.036)
Health(=2)	-	-	-2.33*** (.020)	-2.23*** (.020)
Health(=3)	-	-	-1.30*** (.013)	-1.27*** (0.014)
Health(=4)	-	-	-.561*** (.011)	-.555*** (0.012)
Health(=5)	-	-	0 ^b	0 ^b

Level 2 Control Variables

Table 1, continued

	Model 1	Model 2	Model 3	Model 4
Government Effectiveness	-	-	.288*** (.036)	.301*** (.036)
Unemployment Rate	-	-	-.017*** (.002)	-.017*** (.002)
Government Expense	-	-	-.020*** (.001)	-.019*** (.001)
-2Loglikelihood	1,030,861.3	1,014,761.2	974,517.7	961,765.3
No. of observations	235,825	233,098	229,422	226,922

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Notes: ^b this variable is set to zero as the base category for that variable.

Sample consists of 235,825 individuals residing in 30 European countries. All models include varying intercepts. Trade openness and years of education are mean-centered. Trade openness has been rescaled by dividing 100.

Table 2 Life satisfaction, trade openness and income rank

	Model 5	Model 6
Intercept	6.69*** (.186)	8.98*** (.167)
Trade Openness	0.052 (.069)	.164* (.085)
Relative Income Rank	0.016*** (.001)	.013*** (.001)
Interaction		
Trade Openness* Relative Income Rank	.004*** (.001)	.0.006*** (.001)
Further controls included	No	Yes
-2Loglikelihood	723,337.0	683,763.0
No. of observations	168,310	163,310

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Notes: Sample consists of 235,825 individuals residing in 30 European countries. All models include varying intercepts. Trade openness and relative income rank are mean-centered. Trade openness has been rescaled by dividing 100. Coefficients for the control variables are available on request.

Table 3 Life satisfaction, trade openness and ITE

	Model 7	Model 8
Intercept	6.91*** (.179)	5.79*** (.776)
Trade Openness	.651*** (.069)	.619*** (.081)
ITE	-.017** (.007)	-.008* (.004)
Interaction		
Trade Openness* ITE	-.007 (.001)	-.010 (.011)
Further controls included	No	Yes
-2Loglikelihood	631,426.0	612,916.0
No. of observations	147,537	147,537

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Notes: Sample consists of 235,825 individuals residing in 30 European countries. All models include varying intercepts. Trade openness and ITE are mean-centered. Trade openness has been rescaled by dividing 100. Coefficients for the control variables are available on request.

Table 4 Happiness, trade openness and skill level

	Model 9	Model 10	Model 11
Intercept	8.77*** (.121)	8.84*** (.118)	8.91*** (.141)
Trade Openness	.114* (.058)	.049 (.058)	.052 (.0751)
Education	-	.032*** (.007)	-
Income rank	-	-	.010*** (.002)
Interaction			
Trade Openness*Education	-	.019** (.008)	-
Trade Openness*Income rank	-	-	.014*** (.002)
Further controls included	Yes	Yes	Yes
-2Loglikelihood	920,890.2	908,503.0	646,247.8
No. of observations	229,168	226,657	163,144

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Notes: Sample consists of 235,825 individuals residing in 30 European countries. All models include varying intercepts. Trade openness, years of education and relative income rank are mean-centered. Trade openness has been rescaled by dividing 100. Coefficients for the control variables are available on request.

Table 5 Happiness, trade openness and ITE

	Model 12
Intercept	4.98*** (.691)
Trade Openness	.376*** (.070)
ITE	-.010* (.004)
Interaction	
Trade Openness*ITE	-.001 (.010)
Further controls included	Yes
-2Loglikelihood	574,179.0
No. of observations	147,439

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Notes: Sample consists of 235,825 individuals residing in 30 European countries. All models include varying intercepts. Trade openness and ITE are mean-centered. Trade openness has been rescaled by dividing 100. Coefficients for the control variables are available on request.

Table 6 Life satisfaction, trade freedom, and skill level

	Model 13	Model 14	Model 15
Intercept	8.78*** (.147)	8.84*** (.142)	8.98*** (.167)
Trade Freedom	.623*** (0.108)	.537*** (.108)	.426*** (.122)
Education	-	.038*** (.007)	-
Income rank	-	.-	.013*** (.001)
Interaction			
Trade Openness*Education	-	.024 (.024)	-
Trade Openness*Income rank	-	-	.013*** (.004)
Further controls included	Yes	Yes	Yes
-2Loglikelihood	974,501.7	961,753.0	683,757.2
No. of observations	229,422	226,922	163,310

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Notes: Sample consists of 235,825 individuals residing in 30 European countries. All models include varying intercepts. Trade freedom and relative income rank are mean-centered. Coefficients for the control variables are available on request.

Table 7 Life satisfaction, trade freedom and ITE

	Model 16
Intercept	6.03*** (.774)
Trade Freedom	.785*** (.159)
ITE	-.007 (.005)
Interaction	
Trade Freedom*ITE	-.062 (.085)
Further controls included	Yes
-2Loglikelihood	613,343.0
No. of observations	147,437

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Notes: Sample consists of 235,825 individuals residing in 30 European countries. All models include varying intercepts. Trade freedom and ITE are mean-centered. Trade openness has been rescaled by dividing 100. Coefficients for the control variables are available on request.
