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INTERNATIONAL COMPETITION INTENSIFIED – JOB SATISFACTION SACRIFICED?

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Zusammenfassung / Abstract

There has been an intense debate as to the effects of offshoring and global value chains on labor, with the debate centering around possible negative employment and income effects for the low(er) skilled in advanced economies. Although sociological and psychological research has shown that income falls far too short when it comes to subjective well-being (SWB), the globalization's impact on SWB has been surprisingly under-researched. This applies in particular to job satisfaction, including of those negatively affected by seeing their real income depressed. Against this backdrop, we develop a trade model that is capable of capturing job satisfaction in conjunction with the income and distributional effects of offshoring. Contrary to a great many beliefs, our theoretical considerations suggest that those remaining employed may be more satisfied with their jobs, even if suffering from increased competition and from more tasks being offshored. Running a cross-section logistic regression model that combines information on offshoring and job satisfaction, lends support to our theoretical explanations. Accordingly, job satisfaction is on average rated higher in countries with comparatively high offshoring activities. More disaggregated regressions get to the heart of the matter, which is a change in the characteristics of the remaining jobs. Our results stand up to extensive robustness checks with respect to different specifications, measures of globalization, and even when controlling for many of the usually suspected variables with reference to SWB.

JEL-Klassifikation / JEL-Classification: F66, I31

Schlagworte / Keywords: Subjective Well-Being, Job Satisfaction, Offshoring, Global Value Chains

1. Introduction

Throughout the last decades, many countries have witnessed a substantial increase in out-sourcing-offshoring.[1] Production became virtually global with many steps and tasks in the production process having been moved abroad. According to the OECD-WTO October 2015 edition on trade in value added (TiVA), which provides the most recent numbers of the OECD-WTO project on measuring global value chains (GVCs), foreign value added in exports climbed in the US from 11.46 percent (1995) to 15.03 percent (2011).[2] Over the same period, TiVA rose in Germany from 14.86 to 25.54 percent, in France from 17.29 to 25.13 percent, in Spain from 19.16 to 26.88 percent and in the UK from 18.25 to 23.05 percent. While the US and Australia are at the lower end of the GVC-spectrum, Eastern European countries, such as, for instance, the Czech Republic, Hungary and the Slovak Republic are at the upper end, with a fraction of foreign content in exports of more than 45 percent. All trade within GVCs accounted for almost half of world trade in goods and services in 2011 (WTO 2015). Although a number of indicators lately show a slowdown in GVC-related trade for some countries, the share of intermediates in world trade continues to be high, especially with respect to trade in services, which grew well above average (UNCTAD 2015, pp. 4, 22 et seq., and tables in ch.5).[3]

The rise in offshoring sparked an intense debate as to possible labor market implications. While not undisputed, many studies find that, in the advanced economies, the process of offshoring has contributed to a relative decline in the demand for low-skilled labor as low-skill intensive parts in the production were substituted by cheaper imports from abroad.

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[1]We follow the convention established since UNCTAD (2004, p.148) that defines offshoring as imports of intermediates, regardless of whether they are produced by a foreign affiliate or a third party but in any case produced abroad whereas outsourcing is intermediate production of domestic or foreign origin.

[2]See `http://stats.oecd.org/Index.aspx?DataSetCode=TIVA2015_C2` (as of May 16, 2016) for details.

[3]With measurement problems abound, indicators differ as to the extent and the dynamics of offshoring and vertical specialization across international borders. Numbers thus have to be taken with a grain of salt, see, for instance, Sturgeon (2013) and the survey by Amador and Cabral (2016) on measurement issues. While high with approx. 32 percent, China fails to meet the trend upwards. For a possible explanation drawing on the importance of the domestic market and economic policies see Brandt and Thun (2016). There is no dispute though about the extent being substantial.

Almost all of the studies, however, exclusively concentrated on employment and income effects of this process. In particular wage inequality across workers of different skill levels, occupations and industries were in the focus of interest (see, e.g., Becker and Muendler 2015 and Ebenstein et al. 2015 on country-specific perspectives or Hummels et al. 2016a for a survey).

Surprisingly less research has been done on the effect of offshoring on subjective well-being (SWB). There is a lack of research on the globalization of production and SWB, despite the fact that recent research has shown that income, though important, is just one aspect of life among several that feed into an individual's SWB. Although there is some controversy surrounding the exact channels and impacts, findings suggest that income need not even be positively correlated with SWB (e.g. Easterlin 1974; Veenhoven and Hagerty 1976; Epstein 2008; Helliwell and Barrington-Leigh 2010; Diener et al. 2013). However, SWB in itself is to be considered an amalgam of different perceptions (Hsieh 2016). When thinking about how offshoring might affect SWB, job satisfaction is certainly an issue that immediately comes to one's mind. Naturally, labor economists have for a long time identified job satisfaction as important matter (e.g. Hamermesh 2001; Sousa-Poza and Sousa-Poza 2003; Lévy-Garboua and Montmarquette 2004; Clark et al. 2009; Card et al. 2012). Although, apparently, job satisfaction is an important issue if judged by the sheer number of these contributions to labor market research, the nexus between international trade and job satisfaction has been largely unexplored territory.

In this paper, we try to fill the gap by illuminating the impact of trade and offshoring on job satisfaction. To this end, we draw on a large sample of data from the International Social Survey Program (ISSP), the Penn World Tables (PWT), the World Development Indicators (WDI), trade freedom data by the Heritage Foundation, the Fraser Institute and the KOF globalization indices taking in some 31 countries and 24,619 individuals.[4] In order to under-

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[4]The OECD (see Cazes et al. 2015 for an introduction) also offers data on (subjective) job quality, however, with a large overlapping as to countries. For reasons of consistency and because the ISSP offers a wider set of countries with more variance in the data, we opt for the ISSP. In fact, the OECD job quality data (see `http://stats.oecd.org/Index.aspx?DataSetCode=JOBQ`, accessed May 19, 2016) are based to a

stand the process and how it is embedded into income effects, we develop a model that is capable of explaining consequences of trade and offshoring for job satisfaction in their various dimensions, in particular real income effects and job characteristics. Our results run counter to what might be intuitively considered a negative relationship in the sense that increased competition from abroad and the rise in offshoring might be thought of lowering job satisfaction. Instead, the picture seems to be much more diverse with some trade indicators being associated with a decline in job satisfaction while others report an increase. However, most notably, in countries with more intermediate products being produced abroad (thus resulting in a high offshoring index), job satisfaction scores significantly higher than elsewhere. Our findings prove to be robust in several cross-checks with respect to the data as well as the econometric setup. Digging deeper into the reasons for the positive nexus by means of a further disaggregated approach, we are able to trace the effect back to job characteristics that are considered to improve in the process of offshoring and the associated technological change. Our theoretical model shows that even income effects are not so clear cut as frequently assumed because offshoring shares aspects of technical progress. However, in situations in which income effects of offshoring are adverse indeed, changes in non-pecuniary aspects of the workplace may nevertheless compensate for negative income effects.

Previous contributions that explored how the process of internationalization is individually perceived concentrated on individual preferences over international trade and immigration policies (see, e.g., Scheve and Slaughter 2001; Hanson et al. 2007; Khun et al. 2015); others analyzed the effects of globalization on individual well-being, which seem to exert an SWB effect separate from individual income and distributional consequences. According to Bjørnskov et al. (2008), openness to trade, defined as exports plus imports over GDP, is among the small number of variables that robustly affect individual life satisfaction. Also, trade policy, as measured by various trade freedom indices, is found to significantly affect individual well-being if non-tariff barriers are considered next to the average tariff rate (Dluhosch

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sizable extent on the ISSP. As to the associated measurement issues see Muñoz de Bustillo et al. (2011).

and Horgos 2013). In contrast to actual trade flows, this channel can be interpreted as the option value of trade. Turning to more specific aspects of globalization, Scheve and Slaughter (2004) found that FDI is a key variable significantly increasing worker insecurity. We account for these channels by tracking these various facets of globalization (openness, trade freedom, outward FDI) in addition to offshoring proper, thus moving beyond those contributions.

As to aspects of the workplace in relation to the globalization of production, Geishecker (2008) lends support to the notion that international outsourcing lowers individual employment security significantly. The effect varies with job duration but not with the skill level of the employee. Job loss fears though seem to depend on the region to which production is being offshored: outsourcing to high-wage countries significantly decreases job loss fears while outsourcing to low-wage countries significantly increases those fears (Geishecker et al. 2012). Geishecker (2012) also presents empirical evidence of job security being strongly correlated with individual well-being. Colantone at al. (2015), by drawing on the British Household Panel Survey, present indication for the U.K. that competition and the associated adjustment costs cause mental stress. Hummels et al. (2016b) even find adverse health effects of exports in Danish matched worker-firm data.

This paper, by contrast, is more directly related to issues concerning how the quality of the work place and job characteristics are perceived and thus with overall job satisfaction rather than the particular issue of job insecurity, the fear of losing one's job or the mental stress associated therewith. Yet, the broader issue of job satisfaction, although an obvious candidate when it comes to subjectively evaluating the trend towards the globalization of production, has thus far been largely left out. Böckerman and Maliranta (2013) is one of the few exceptions. Exploring matched employer-employee data for Finland, they see a "silver-lining" in that outsourcing has some positive effects on employee well-being via intrafirm occupational restructuring. Because their results are based on those remaining employed and the case of Finland in particular, they are reluctant, however, to draw wider conclusions as to possible economy-wide effects or whether effects reach beyond the case of Finland.

Also, they do not differentiate between outsourcing within and between countries, whereas our focus is specifically on the impacts of international outsourcing. We also widen the perspective by use of ISSP data on more countries and thus a more comprehensive sample of individuals. Still, the positive nexus between (international) outsourcing and job satisfaction holds. Seemingly, offshoring-related changes in job characteristics can even dominate income effects. Notably, in this respect, our findings are in line with Yeh (2015), who, based on data from the 2005 ISSP (Work Orientations III), provides empirical evidence for East Asia of job quality being more important than earnings for job satisfaction. Speculating on the reasons, she considers this specifically tied though to the guanxi tradition in East Asia which is absent in more Western societies.

Other than the aforementioned studies we will in addition to the empirical evidence on the nexus offer a theoretical explanation as to why and how offshoring affects job satisfaction which adds to our understanding of the relationship. With respect to the theoretical explanation, we will borrow from an offshoring model by Dluhosch and Hens (2016). However, our approach will differ from theirs in several respects. First, our model is explicitly geared towards offshoring low-skilled labor tasks in each unit produced whereas theirs requires a combination of production factors with the possibility of induced technical change featuring a bias toward one or the other skill-level. Our approach allows us to dissect and better track down the effects of offshoring specifically for those whose work is being offshored. Secondly, in our explanation, tasks are considered as being substituted by imported IT-intensive intermediates with the intermediates production subject to economies of scale to the fullest extent, to the effect that the intermediate sector tends to concentrate locally in whichever market has a head start in terms of size. Our decision to do so is motivated by the fact that much of offshoring is driven to a substantial extent by information and communication technologies (ICT) which are associated with economies of scale. Theirs, by contrast, sticks to a multi-firm intermediate sector, thus choking off issues of scale. Third, and most importantly, our model is enriched by offshoring-related changes in job satisfaction. With

respect to the way these non-pecuniary aspects are incorporated in the model, we follow Lü et al. (2012), who consider well-being a weight function of objective and subjective inputs. However, while their focus is on non-pecuniary aspects related to income comparisons and how income inequality is perceived (see also Clark and Oswald 1998 for various specifications as to relative positions), ours is on the fragmentation of the production process and on offshoring-related changes in workplace characteristics. It thus offers a novel explanation as to how offshoring impacts job satisfaction besides any consumption effects it might have on subjective well-being.

The remainder of the paper is in three major parts. In Section 2, we set out our theoretical approach to explaining how offshoring affects job satisfaction via several channels. Appendix 1 features all steps necessary for deriving the results and a small simulation study gives a first impression on net effects of pecuniary and non-pecuniary aspects of offshoring and how the separate effects relate to each other by parameterizing their composite. Section 3 then is devoted to the empirical analysis. After introducing the data, we employ a cross-section logistic regression model to estimate the impact of various dimensions of trade (and offshoring in particular) on job satisfaction. In Section 4, we perform multiple robustness checks on the empirical setup. Section 5 summarizes and finishes off with some thoughts on future research.

2. A Theoretical Approach to Offshoring and Individual Job Satisfaction

Suppose the economy is populated by low- and high-skilled individuals, L and H, with each of them supplying one unit of labor to the market and with labor markets of the two skill-levels segmented. In line with much of the research on globalization's impact on low-skilled labor in advanced economies, we will particularly focus on the low(er) skilled and how they fare when production moves offshore as supposedly it is them, who bear the brunt of this process.

As to supply, imagine the economy features four sectors. Three of these sectors produce goods for final consumption. One of these final-goods producing sectors carries subscript 0 and serves as numéraire; the other two sectors with subscripts 1 and 2 represent manufacturing. Sector 1 shall be specifically in the focus of this analysis as it is assumed to produce exclusively with low(er)-skilled labor, and by use of (probably imported) intermediates. Qua assumption, these intermediates may substitute for low(er) skilled-labor, which makes the workforce in sector 1 effectively susceptible to offshoring.

Here, we will focus on the process of offshoring as triggered by trade liberalization. We will present a trade-related offshoring framework in which intermediates are produced by an IT-Sector and with production subject to economies of scale. The cost advantages of scale may be driven, for instance, by the joint sponsoring of a local university, by the benefits of agglomeration such as the sharing of an appropriate infrastructure, or, by localized positive spill-overs in entrepreneurial spirit as is considered present in the Silicon Valley. With trade more liberalized, intermediates production then tends to move to the place where these economies are the strongest. Hence, for any given fixed cost component that can be shared, intermediates production will concentrate in those places that already have a head-start in terms of output. The result is lower (relative) prices of these intermediates, to the effect that some of the low-skilled labor in the production of each unit of good 1 is displaced. For those remaining employed in sector 1 the question arises how they fare in terms of real incomes, and, ultimately, in terms of job satisfaction.

For the moment, however, we will postpone the question of job satisfaction and instead illuminate our model economy in some more detail because goods and factor prices change in the offshoring process, as does employment, and, in response, consumption patterns, all of which feeds into how offshoring is perceived by those, who, on face of it, are negatively affected thereby.

In order to capture those effects, it suffices however, that we primarily describe a single country (Home) that faces a larger world economy. Let the output, X_0, of the numéraire

in this country be a linear function of low-skilled labor L_0 with parameter α: $X_0 = \alpha L_0$. And, let output in sector 2 be a linear function of high-skilled labor, H_2, with $X_2 = H_2$. Output in sector 1, by contrast, requires low-skilled labor L_1 and intermediates z, which may be produced offshore and bought at price p_z, and which, for any given output, may partially substitute for low-skilled employment according to the following production function $X_1 = z^\beta L_1$, with β a technical parameter.

Final goods 1 and 2 sell at prices p_1 and p_2 with both of these prices determined by supply and demand, as is the price of intermediates p_z. Low-skilled labor may be employed at the prevailing market wage w_L, high-skilled labor at wage w_H. Notably, wage w_H will be determined endogenously by the implied supply and demand, and with reference to the numéraire. As the numéraire is produced exclusively by lower-skilled labor with factor α, wage w_L serves as reference point for all distributional impacts at $w_L = \alpha$.

With these assumptions, profit functions in the three final goods producing sectors are thus

$$
\begin{array}{llll}
\text{numéraire} & \pi_0 = X_0 - w_L L_0 & \text{with} \quad X_0 = \alpha L_0 & (1) \\[2mm]
\text{sector 1} & \pi_1 = p_1 X_1 - w_L L_1 - p_z z & \text{with} \quad X_1 = z^\beta L_1 & (2) \\[2mm]
\text{sector 2} & \pi_2 = p_2 X_2 - w_H H_2 & \text{with} \quad X_2 = H_2 & (3)
\end{array}
$$

IT-intermediates in turn require high-skilled labor, H_z, with production function $z = H_z$ and with labor demand competing with sector 2, so that labor in the IT sector must at least be paid the same wage w_H. High skilled wages thus make for variable costs. Any fixed costs F in the IT-sector, however, shall be thought of services being bought from the (low-skill intensive) numéraire sector. However, because of these fixed costs F, the intermediate sector, that is IT services, operates on increasing returns, so that the profit function there is

$$
\text{intermediate} \quad \pi_z = p_z z - w_H H_z - F \quad \text{with} \quad z = H_z \quad (4)
$$

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with z according to the demand by sector 1, which is implied by the profit maximizing behavior in the production of good 1 and with production of good 1 at the economy-wide demand for good 1. Qua assumption, these intermediates are supplied by the IT-sector at their average unit costs so that, because of the fixed cost degression per unit, the increasing returns fully play out in tandem with increases in the sales of z.[5] Note that this set up follows a modern approach to offshoring which is nowadays also driven to a substantial extent by (or at least with the help of) information technologies rather than simply substituting local labor for cheap low-skilled labor abroad by means of imported intermediates. Anyway, in this process, low(er) skilled labor per unit of output is presumably either displaced or it sees its relative income in real terms depressed. Although, depending on substitution and income effects, these negative effects need not materialize when considering all of the repercussions of this process in the economy, it is exactly what much of the concern with respect to offshoring is about.

However important, there is more to offshoring than just income effects which in turn influence consumption possibilities and thus map into (subjective) well-being and job satisfaction in particular. Before illuminating more closely what makes for job satisfaction in addition to those effects, we will quickly summarize what drives the demand for the various types of labor.

Turning to local factor markets, recall the assumption that all workers supply inelastically one unit to the market with labor mobility across sector 1 and the numéraire (low skilled) and sector 2 and the IT sector (high skilled) respectively. To accommodate the increasing returns properties of the model, we suppose that labor demand and thus effectively the allocation of labor across sectors is governed by the potential threat of entry into all of the product markets. With product markets thus contestible, sector-specific zero-profit conditions prove central for labor demand with the skill-specific demands ($L_0 + L_1$ and $H_2 + H_z$) adding up

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[5]This is for sure a simplifying assumption. Alternatively, one could also think of marginal revenue pricing, however, with the ultimate difference in this framework a matter of degree rather than substance. Note though that, with pricing according to average cost, we have to impose $F < \beta\theta\left(L + H\right)$ on fixed costs F a priori and prior to trade liberalization to ensure economically meaningful results.

to supply L and H. This completes our supply side of the model as far as the Home country is concerned.

As to the demand side of the model, we will start out with the assumption that job satisfaction is a composite of two things, namely preferences over consumption possibilities (that is real income) and job characteristics related to offshoring. Focusing on a representative type-L worker that remains employed in sector 1, his or her job satisfaction, JS_{L_1}, can thus be written as

$$JS_{L_1} = u \left(\text{consumption} \right) + v \left(z \right) \tag{5}$$

with consumption of the basket of the three final goods (c_0, c_1, c_2) subject to his or her budget restriction $w_L \geqslant c_0 + p_1 c_1 + p_2 c_2$. This composite assumption about job satisfaction is in line with much of the research on worker's perceptions such as, for instance, in Card et al. (2012) or Lü et al. (2012). However, there, the focus is in the second part on peer salaries, or, more generally, inequality. Here, by contrast, we will track perceptions as to offshoring as an amalgam of consumption possibilities (1st part of eq.(5)) and outsoucing-offshoring related workplace characteristics (2nd part of eq.(5)), both of which are subject to change as competition intensifies by trade being liberalized. To simplify, we assume that consumption affects utility according to the following specific logarithmic function which, presumably, is the same across all workers of all types and sectors so that we can drop subscripts L_0, L_1, H_2, H_z.

$$u \left(\text{consumption} \right) (c_0, c_1, c_2; \theta) = c_0 + \theta \cdot \log \left(c_1 \right) + (1 - \theta) \cdot \log \left(c_2 \right) \tag{6}$$

with θ a preference parameter governing the distribution of expenditure on the two goods 1 and 2. If all of the workers try to maximize utility from consumption subject to their specific income (wage w_L and w_H respectively), total demand C_1, C_2 for the two final goods

1 and 2 in this model economy amounts to

$$C_1 = \frac{\theta}{p_1}(L + H) \quad \text{and} \quad C_2 = \frac{(1 - \theta)}{p_2}(L + H).$$ (7)

with the rest of the income spent on the numéraire. The usual assumptions concerning interior solutions apply.

We thus have supply and demand in the Home economy (that is for all final goods and the intermediate) prior to trade integration with a (larger) world economy. Supposing that all markets are cleared then delivers all values for all of the variables, including low-skilled employment L_1 in sector 1, the quantity z and the price p_z of intermediates, the relative wage w_H/w_L, consumption c_1, c_2 at prices p_1 and p_2, and, most importantly, job satisfaction JS_{L1} of our representative low-skilled individual.

Instead of explicitly solving for all of these variables prior to trade integration, we will consider directly a world economy that exceeds both high- and low-skilled endowment of the Home economy, that is $(L + H)$, by a factor $(1 + A)$. For $A = 0$, this comprehensive approach includes the case prior to trade integration. The intermediates sector will thus exploit economies of scale for $\forall A > 0$ while concentrating abroad for $A > 1$. Knowing this and supposing all markets are cleared with product and factor price equalization then allows to derive all variables, now of the world economy. The adding-up properties of the model in some of the lines of production then also yield those variables that are specific to Home and the low-skilled in sector 1 as a function of parameter A (or $(1 + A)$ for that matter). Appendix 1 summarizes the main steps in getting at the results.

Tracking down how variables change as integration proceeds, that is, considering the first derivative with respect to $(1 + A)$, shows that the (relative) wage of the high-skilled increases, as does the price of good 2 in terms of the numéraire whereas the price of good 1 decreases in tandem with the price of intermediates p_z. Consequently, the use of (imported) intermediates, z, increases in absolute as well as in relative terms, that is, relative to local output of good 1 *and* relative to total employment of low-skilled labor in the production of good 1. Each unit

of good 1 is thus produced with *less* low-skilled labor and *more* intermediates from abroad: a higher intermediate intensity means that part of the production has moved offshore as the world economy effectively becomes larger via trade integration.

However, when considering exclusively real income in terms of good 1, the low-skilled are better off as they benefit from the increase in productivity implied by lower prices for intermediates and effectively offshoring parts of the production. Notably, this positive income effect differs from the traditional Stolper-Samuelson effect of moving (low-skilled) production abroad, which is negative. The difference is due to the economies of scale in the IT-sector. As the IT-sector undeniably plays an increasing role in managing global production, it is at least nowadays – and with much of the trade in intermediates – much more realistic than its constant-returns Stolper-Samuelson counterpart.

In terms of good 2, though, low-skilled labor loses out. Whether the low-skilled in fact become (relatively) poorer in terms of purchasing power in the course of trade integration thus depends on their preferences over the two goods, which, here, are captured by parameter θ. The larger $(1 - \theta)$, that is, the higher the preference for good 2, the more likely they suffer from negative income effects.

However, taking into account that job characteristics change in the course of this process, that is, the second part of JS_{L1} in eq.(5), yields a much more diverse picture. For in this case, the low-skilled need not be worse off even when preferences are sufficiently biased towards the relatively more expensive good 2 such that their real income declines. As the low-skilled intensity of each unit in the production of good 1 is subject to change, so is most likely the job characteristic of those employed in sector 1, which we proxy by the impact of trade integration on offshoring particular tasks, that is, measure z. More specifically, job characteristics improve, if those tasks are substituted by imported intermediates that are particularly unpleasant. Depending on how the changes in job characteristics are perceived relative to real income, job satisfaction may improve despite real income effects telling a different story. Referring to JS_{L1} in eq.(5), Fig.1 shows net effects on job satisfac-

tion assuming that $v(z) = \mu z$ and with parameter μ thus capturing the relative importance of job characteristics as compared to income. Each curve in Fig.1 shows how both effects of offshoring-outsourcing are amalgamated into overall job satisfaction, with the (relative) weight of workplace characteristics increasing from the bottommost to the topmost curve and with income effects in any case negative.[6]
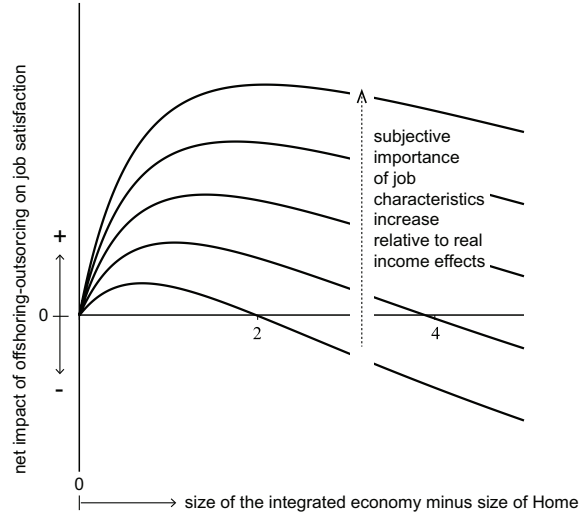

Figure 1: Net effect of offshoring-outsourcing on individual job satisfaction

Net effects on job satisfaction are not positive throughout, but for a range of parameter values (A, μ), and, most notably, independent of the location of the (productivity enhancing) IT-sector. Note that in Fig.1, job satisfaction is plotted against A so that the world economy increases (as compared to Home) for any $A > 0$, however, with Home larger than the rest of the world for all $A < 1$ and smaller otherwise. Hence, for $A < 1$, home hosts the IT-sector, while for $A > 1$ it is located abroad and with $A = 1$ indeterminate. Gains in job satisfaction via offshoring-outsourcing and import of intermediates with IT-services tapper off as the integrated economy becomes larger (that is, as A increases) while consumption effects become more depressing, to the effect that there is a tipping point beyond which the net effect is considered negative and job satisfaction on balance deteriorates. In Fig.1 the

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[6]Figure 1 has results for the following parameter values: $\theta = 0.1$; $\beta = 0.02$; $H = L = 50$; $F = 0.1$; $\alpha = 2$ and for μ increasing from $\mu = 0.03$ (bottommost) to $\mu = 0.05$ (topmost).

tipping point depends on the relative importance of workplace characteristics μ. However, this does not necessarily imply that job satisfaction is certainly to decline at some point in time for any given μ (provided trade integration continues and deepens). This is because curves may well shift, for instance, with productivity gains in either the IT-sector or the productivity enhancing effect of intermediates in the production of good 1 (i.e. parameter β). Other influences are preferences over the three final goods and the world's composition of the labor force, which here is assumed to be exactly the same as in the Home economy with pure size effects as drivers of the net effects on job satisfaction.

A closer theoretical examination thus has shown that offshoring-outsourcing related job satisfaction is not only a matter of real income effects, but is also affected by the change in tasks, with the latter possibly compensating for negative income effects. In the next paragraph, we will approach the issue of job satisfaction from the empirical side in order to get a better grasp on the actual parameter values and the actual net effects, thus complementing the theoretical explanation above.

3. Approaching the Effects of Globalization on Job Satisfaction Empirically

To investigate trade (policy) effects on individual job satisfaction empirically, it is necessary to combine individual information (e.g. perceived job satisfaction) with more aggregated country- or industry-level data (e.g. trade policy, offshoring, FDI, etc.).

3.1 Data

Information for the endogenous variable job satisfaction is taken from the International Social Survey Program (ISSP), which, in its 2005 version (Work Orientation III), especially surveys individual perceptions at work. It provides ordinal information on individual job satisfaction. Individuals can respond to the question "How satisfied are you in your (main) job?" with "completely satisfied", "very satisfied", "fairly satisfied", "neither satisfied nor dissatisfied", "fairly dissatisfied", "very dissatisfied", or "completely dissatisfied". Thus, the

endogenous variable job satisfaction has an ordinal scale with values ranging from 1 ("completely dissatisfied") to 7 ("completely satisfied"). The ISSP provides information on 24,619 individuals in 31 countries.[7]

The exogenous variables of main interest capture different dimensions of globalization at the country level:

1. Trade Policy: We include the trade freedom index by the Heritage Foundation as a proxy for how restrictive trade policies are. Measuring trade policy empirically is not an easy task. Using only particular trade policy measures, as, e.g., the weighted average of tariff rates, does not account for the heterogeneity in trade policy. It neglects, e.g., a wide range of non-tariff barriers. Two frequently cited indices (one provided by the Heritage Foundation and the other one provided by the Fraser Institute) provide interesting alternatives. Both indices are calculated annually with documented calculation schemes. While the index of the Fraser Institute also captures black market issues and capital flow restrictions, the index of the Heritage Foundation is closer to pure trade restrictions, namely tariff and non-tariff barriers. To test the robustness of our results, we additionally apply the KOF globalization index.[8]

2. Trade Flows: In addition to trade policy, we include information on trade flows. While trade policy captures the option value of international trade, that is the possibility opened up by trade liberalization, actual trade flows might differ substantially. To take these differences into account, we include actual trade flows as an aggregate measure of openness (that is conventionally the ratio of imports plus exports to GDP at the

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[7]Table 6 in Appendix 2 lists all countries covered by the ISSP information (Column 1). The distribution of the variable job satisfaction is presented in Table 7.

[8]The index of the Heritage Foundation is available at `http://www.heritage.org`. It measures the absence of tariff and non-tariff barriers and varies between 0 and 100 on a percentage scale. Tariffs are aggregated using the trade-weighted average tariff rate. A penalty scheme considers additional non-tariff barriers. For more detailed information on how the index is calculated see the webpage of the Heritage Foundation. To download the index of the Fraser Institute see `http://www.freetheworld.com`. For further information about the KOF globalization index see `http://globalization.kof.ethz.ch`.

country level) from the Penn World Tables (PWT).[9]

3. Offshoring and FDI: Besides trade policy and trade flows, we include net FDI outflows (as percent of GDP) and offshoring activities as more specific facets of globalization. Information on FDI flows are obtained from the World Development Indicators (WDI). Offshoring is calculated using Eurostat input-output tables.[10] In line with the majority of recent contributions to international economics, the offshoring index here does not distinguish between the ownership structure of foreign production: it contains imports of inputs at arms' length as well as imports from foreign subsidiaries. Applying the calculation schemes presented in Horgos (2009) and Castellani et al. (2013), we consider an aggregate measure of offshoring (that is all inputs used in production), material offshoring (material inputs used in production), and service offshoring (service inputs used in production). As will be seen shortly, interesting results emerge i.a. with respect to the interplay between FDI outflows and the offshoring index. When additionally controlling for offshoring activities that capture the part of FDI flows that is related to a relocation of production, pure investment decisions are left for the FDI variable. Both of the components affect individual job satisfaction quite differently.

When examining the implications of the different dimensions of globalization on individual job satisfaction, it is necessary to include individual as well as country-level control variables. To control for as much individual and country-level variance as possible, we include a large set of control variables.[11] As individual control variables we consider job security, individual income, gender, age, age^2, marital status (married, widowed, divorced, single, cohabiting), years of schooling, and education. In contrast to many contributions to the well-being lit-

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[9]The PWT dataset is available at `https://pwt.sas.upenn.edu`. This contribution uses version 7.0 available since June 2011.

[10]The WDI is available at `http://data.worldbank.org/data-catalog/world-development-indicators`. We use the WDI & GDF data from April, 19th 2012. The input-output tables from Eurostat are available at `http://epp.eurostat.ec.europa.eu/portal/page/portal/esa95_supply_use_input_tables/introduction`.

[11]To decide which control variables to be used for the regressions in this contribution, we refer to Scheve and Slaughter (2001, 2004), Hanson et al. (2007), Bjørnskov et al. (2008), Skalli et al. (2008), Geishecker (2008, 2012), Geishecker et al. (2012).

erature that draw on more aggregated measures like happiness or life satisfaction, this contribution shifts the focus on job satisfaction in particular. Therefore, additional individual control variables that capture different job characteristics are included. As to these job characteristics, we include information on whether employees rate their job as secure, interesting, independent, exhausting, hard work, and/or stressful. All individual control variables are taken from the ISSP 2005. In order to account for income effects, we include the log of GDP per capita (in international dollar, PPP converted at 2005 constant prices, obtained from PWT). As additional macroeconomic control variables we consider the log of population (also obtained from the PWT) and the unemployment rate (in percent of total labor force; provided by the WDI). Overall, the data consists of cross-section information for 24,619 individuals of 31 countries in the year 2005. For each country, between 900 and 2,800 individuals have been surveyed.

3.2 Estimation and Results

To examine how international trade (policy) affects individual job satisfaction, we apply a cross-section analysis for 2005. Because the endogenous information (individual job satisfaction) has an ordinal scale whereas the regressors (trade policy, trade flows, and the more specific dimensions of trade flows, namely FDI and offshoring) are metric variables with information in percent, we employ a logistic regression model. In estimating the model, we face an additional challenge though in that the endogenous variable is at the level of the individual whereas the exogenous variables of main interest are economy-wide aggregates. One common solution to this problem is to control for enough individual and country-level variance and to cluster the errors at the country level (see Chamberlain 1980; Alesina et al. 2004; or Ferrer-i-Carbonell and Frijters 2004). We thus derive the logistic regression model from the latent variable estimation

$$JS_{ij}^* = \beta_1 TP_j + \beta_2 TF_j + \beta_3 FDI_j + \beta_4 OFF_j^z + \beta_5 IC_{ij} + \beta_6 CC_j + \epsilon_{ij} \qquad (8)$$

with vector JS_{ij}^* containing latent job satisfaction of individual i living in country j. The seven ordered categories of job satisfaction that could be observed are defined as $JS_{ij} = 1$ if $JS_{ij}^* \leq a_1$, $JS_{ij} = 2$ if $a_1 < JS_{ij}^* \leq a_2$, ..., $JS_{ij} = 6$ if $a_5 < JS_{ij}^* \leq a_6$, $JS_{ij} = 7$ if $a_6 < JS_{ij}^*$. The four exogenous variables of main interest are trade policy, TP_j, (proxied by the trade-freedom index from the Heritage Foundation), trade flows, TF_j, (that is the openness measure), FDI net outflows, FDI_j, and offshoring activities, OFF_j^z, all measured at the level of country j. We consider three different variants z of offshoring: aggregated offshoring ($z = a$), material ($z = m$) and service offshoring ($z = s$). Individual control variables are combined in matrix IC_{ij}; matrix CC_j captures the macroeconomic information. Because we are interested in the implications of aggregate variables in microeconometric regressions, we cluster the errors (ϵ_{ij}) at the country level. To achieve robust standard errors, the Huber/White sandwich estimator is applied in all of the regressions.

Table 1 has the main estimation results. Column (1) adds our four main exogenous variables to the set of individual and country-level control variables.[12] We calculate the offshoring activity by drawing on the input-output tables provided by Eurostat. Consequently, the sample is restricted to European economies when including the offshoring index. We then end up with 3,800 individuals in 12 European countries.[13] As to the European economies, a more liberal trade policy (trade freedom) is significantly correlated with lower levels of individual job satisfaction. Job satisfaction is also lower in countries that have a larger openness index, with the nexus statistically significant at the level of 1 percent. The more intermediates are produced abroad (leading to a high offshoring index), the higher is the job satisfaction as

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[12]Table 1 presents results for the exogenous variables of main interest. The complete table, including estimation results for all control variables, is presented as Table 8 in Appendix 2. All individual and country-level control variables are robust concerning sign and statistical significance in most of the regressions applied.

[13]In addition to the information of which countries are covered by the data, Table 6 in Appendix 2 shows also how much information is lost when controlling for the different variables.

Table 1: Effects of International Trade on Individual Job Satisfaction

Endogenous Variable: Individual Job Satisfaction

	(1)	(2)	(3)	(4)
Trade Freedom	−.0388**	−.0488***	−.0675***	−.0402***
	(−1.94)	(−2.91)	(−3.07)	(−5.04)
Openness	−.0104***	−.0086***	−.0019	−.0049**
	(−4.89)	(−5.70)	(−0.50)	(−2.03)
Outward FDI	−.0409**	−.0489***	−.0897***	.0062
	(−2.12)	(−2.45)	(−2.73)	(0.32)
Offshoring	5.8098***	-	-	-
	(3.18)			
- Imp. Penetration	-	1.4828***	-	-
		(4.42)		
- Prod. Structure	-	3.0500	-	-
		(1.20)		
Material Offshoring	-	-	−4.4737	-
			(−1.10)	
- Imp. Penetration	-	-	-	−.2959
				(−1.16)
- Prod. Structure	-	-	-	−5.5236***
				(−2.63)
Service Offshoring	-	-	2.4330	-
			(1.20)	
- Imp. Penetration	-	-	-	.2600**
				(2.28)
- Prod. Structure	-	-	-	−11.8015***
				(−15.92)
Ind. Controls	YES	YES	YES	YES
Macro Controls	YES	YES	YES	YES
Obs.	3,799	3,799	3,799	3,799
Clusters	12	12	12	12
Pseudo R2	.1493	.1496	.1498	.1509

z-Statistics in parentheses; * / ** / *** denoting statistical significance at the level of 10 / 5 / 1 percent.

stated by the individuals of that country. With a z-value of 3.18, the effect is statistically significant at the level of 1 percent. Outward FDI exhibits a significant negative correlation with individual job satisfaction. With a pseudo R-square of 0.1493, the overall model is fitted well. Switching perspective to job satisfaction and the quality of work life thus delivers interesting insights beyond the distributional consequences of globalization. Contrary to conventional beliefs, offshoring obviously has a positive effect on job satisfaction. Seemingly, it affects the quality of the job or the tasks performed.

In the regression presented in Column (2), we focus on findings by recent contributions to the offshoring literature. If the analysis is not conducted at the level of the firm, it is necessary to proxy offshoring activities at the level of industries. In an attempt to do so, different indices have been designed. However, commonly, these indices relate the imported intermediates of an industry to some measure of output to the effect that indices may implic-

itly differ as to the numerator of the denominator. In order to dissect the two components of the offshoring index, we follow i.a. Horgos (2009) and Castellani et al. (2013), who decompose the index by looking at two ratios, namely the ratio of imported to domestically sourced intermediates and the ratio of domestically sourced intermediates to gross output. The ratio of imported to domestically sourced intermediates thus measures the effect of offshoring and international competition proper. The respective variable is denoted in table 1 by "Import Penetration" (Imp. Penetration). The ratio of domestically sourced intermediates, by contrast, captures more of a feature of the respective economy's production structure per se and is denoted by "Production Structure" (Prod. Structure). Accounting for the differences, we replace the offshoring index by these two components. Column (2) has the results. Accordingly, it is import penetration and thus foreign competition that increases job satisfaction of domestic individuals. Import penetration is positive and, with a z-statistic of 4.42 statistically significant at the level of one percent.

In Column (3) and Column (4), we distinguish in addition between material and service offshoring, however, with no significant additional result. Column (4) shows that the production-structure components of the indices are negatively correlated with individual job satisfaction, whereas especially the import-penetration component of service offshoring has the positive explanatory power. It is important though to note that a possible multicollinearity problem may bias results in Column (4), because, there, we combined a variety of aggregated indices measuring similar economic activities.

Results thus show that individual job satisfaction is significantly higher in countries with intensive offshoring activities. By contrast, in countries with relatively high net FDI outflows, individual job satisfaction is significantly lower. The reason for the latter effect seems straight forward: capital invested abroad means that there is, ceteris paribus, less capital at home which might have otherwise, e.g., improved domestic job or working conditions. An economic interpretation of the offshoring effect needs additional explanation. As discussed in the theoretical section, offshoring may change the content as well as the quality of tasks, beyond

Table 2: Correlation Matrix of Job Characteristics

	Job Satisfaction	Interesting	Independent	Exhausting	Hard Work	Stressful
Job Satisfaction	1					
Interesting	0.4795*	1				
Independent	0.2684*	0.4014*	1			
Exhausting	−0.1662*	−0.0946*	−0.0729*	1		
Hard Work	−0.1210*	−0.1599*	−0.0761*	0.3758*	1	
Stressful	−0.1873*	−0.0390*	−0.0525*	0.4453*	0.1821*	1

* denoting a significant pairwise correlation coefficient at the level of 1 percent.

any distributional consequences. But which work-place characteristics are precisely affected by offshoring?

The ISSP data provides information as to whether individuals perceive their job as interesting, independent, exhausting, hard work, or stressful. We already considered these variables as individual controls in the regressions presented in Table 1, because they are contributing factors in overall job satisfaction also quite independently of offshoring. However, now, we will shift the focus of the analysis to a more disaggregated level and examine these diverse facets of job satisfaction in greater detail. Before estimating the effects of offshoring on these (subjective) work-place characteristics, Table 2 displays the correlation matrix of the different job characteristics. The pairwise correlations in Table 2 show that job satisfaction is positively correlated with the job being perceived as interesting and/or independent. By contrast, a job which is perceived as exhausting, hard work, or stressful is negatively correlated with individual job satisfaction.

Table 3: Effects of International Trade on Different Job Characteristics

Endogenous Variable:	Interesting	Independent	Exhausting	Hard Work	Stressful
	(1)	(2)	(3)	(4)	(5)
Trade Freedom	.1098***	−.0977***	.0496*	−.0989***	−.0008
	(3.38)	(2.77)	(1.72)	(−4.45)	(0.07)
Openness	−.0067	.0101	.0091	−.0135***	−.0037*
	(−1.60)	(1.21)	(1.19)	(−2.71)	(−1.72)
Outward FDI	−.0034	−.1327*	−.1801***	.1538***	.0772***
	(−0.08)	(−1.75)	(−2.96)	(3.41)	(4.52)
Offshoring	7.1240**	−5.9418	2.5904	3.7351	−3.4282**
	(2.25)	(−0.91)	(0.57)	(1.13)	(−2.18)
Ind. Controls	YES	YES	YES	YES	YES
Macro Controls	YES	YES	YES	YES	YES
Obs.	3,824	3,824	3,824	3,824	3,824
Clusters	12	12	12	12	12
Pseudo R2	.1217	.1109	.1461	.1068	.1028

z-Statistics in parentheses; * / ** / *** denoting statistical significance at the level of 10 / 5 / 1 percent.

In the next set of regressions we thus use the separate job characteristics as different endogenous variables instead of the aggregate measure of job satisfaction. This procedure enables us to find out which characteristic of the job is affected the most by international outsourcing. Table 3 presents the results. Results show that the international relocation of parts of production (that is high values of the offshoring index) correlates positively with jobs being considered more interesting. The effect is statistically significant at the level of 5 percent. Thus, in economies with high levels of offshoring, employees perceive their job to be relatively more interesting. In addition, offshoring shows a statistically significant negative impact on the stressfulness of tasks.

4. Picking Out the Cherries or (Simply) Statistical Cherry-Picking?

Job-satisfaction data thus yields novel insights into the implications of offshoring, beyond the ones on income and distributional consequences. To check how robust these effects are, we apply a variety of robustness tests as to the empirical set up.

When controlling for material and service offshoring and simultaneously accounting for differences due to import penetration and the production structure in offshoring (Column 4 in Table 1), the z-score for the production-structure component of service offshoring turns out to be uncommonly high at -15.92. Although neither this estimation nor the coefficient is of particular importance for our argument, we address this issue here. This is also because one might be inclined to argue that focusing exclusively on import penetration is closer to the very "heart" of the offshoring process, that is, where international competition takes place. To account for this concern, we replace the offshoring indices by their import-penetration components. The results in Table 4 support our findings. Import penetration in the aggregate is positively correlated with individual job satisfaction, with the positive effect statistically significant at the level of 1 percent (Column 1). When considering import penetration of material and service inputs, it is import penetration of services that turns out to be the main driver in our result. Column (2) illuminates that more intensive import penetration of

Table 4: Effects of Import Penetration on Individual Job Satisfaction

Endogenous Variable: Individual Job Satisfaction
Replacing the offshoring indices by import penetration

	(1)	(2)	(3) Odds Ratios	(4) Odds Ratios
Trade Freedom	$-.0404^{**}$	$-.0521^{***}$	$.9604^{**}$	$.9491^{***}$
	(-2.24)	(-3.68)	(-2.24)	(-3.68)
Openness	$-.0092^{***}$	$-.0030$	$.9908^{***}$	$.9970$
	(-6.81)	(-0.91)	(-6.81)	(-0.91)
Outward FDI	$-.0383^{**}$	$-.0656^{***}$	$.9624^{**}$	$.9364^{***}$
	(-2.44)	(-2.86)	(-2.44)	(-2.86)
Imp. Pen. (total)	1.2028^{***}	-	3.3293^{***}	-
	(4.12)		(4.12)	
Imp. Pen. (material)	-	$-.2482$	-	$.7802$
		(-0.90)		(-0.90)
Imp. Pen. (services)	-	$.6946^{***}$	-	2.0028^{***}
		(4.20)		(4.20)
Ind. Controls	YES	YES	YES	YES
Macro Controls	YES	YES	YES	YES
Obs.	$3,799$	$3,799$	$3,799$	$3,799$
Clusters	12	12	12	12
Pseudo R2	.1494	.1499	.1494	.1499

z-Statistics in parentheses; * / ** / *** denoting statistical significance at the level of
10 / 5 / 1 percent.

services affect job satisfaction significantly positive. Calculating the odds ratios of the logit model reveals an important size of the correlation for import penetration in the aggregate (Column 3) and of services (Column 4). As a side effect, z-scores decrease to lower but still very significant levels as we avoid including too many aggregated index components and thus possible problems regarding multicollinearity.

Our findings also prove robust when distinguishing between different groups of employees. Table 5 presents regression results when differentiating between employees with low and high education (measured with two different variables: years and degree of education) and employees with low and high levels of income. A comparison of the results presented in Columns (1) and (2) (that is, distinguishing by years of education), reveals that the positive correlation of offshoring with individual job satisfaction holds especially for low educated individuals. The same result shows up when using the degree of education as distinguishing variable (Columns 3 and 4). In light of our findings that jobs are perceived as being more interesting and less stressful in countries with high offshoring indices, it is especially the group of the low skilled that can thus be assumed to have the strongest leverage. As to individuals from different income groups (Columns 5 and 6), the significant positive effect of

Table 5: Effects on Job Satisfaction, Distinguishing Between Different Groups of Labor

Endogenous Variable: Individual Job Satisfaction

	Education (years)		Education (degree)		Income	
	low	high	low	high	low	high
	(1)	(2)	(3)	(4)	(5)	(6)
Trade Freedom	−.0137	−.0436**	−.0296	−.0316*	−.0561**	.0438**
	(−0.43)	(−2.16)	(−0.75)	(−1.73)	(−2.16)	(2.06)
Openness	−.0294***	−.0062**	−.0269***	−.0061*	−.0090***	−.0156*
	(−3.59)	(−1.96)	(−3.79)	(−1.75)	(−2.80)	(−1.66)
Outward FDI	−.0154	−.0340	−.0368	−.0237	−.0419**	−.0076
	(−0.40)	(−1.12)	(−0.95)	(−0.76)	(−1.98)	(−0.09)
Offshoring	17.2554***	2.7814	17.4047***	2.4519	4.8989*	8.5690*
	(3.07)	(1.33)	(3.81)	(1.05)	(1.87)	(1.73)
Ind. Controls	YES	YES	YES	YES	YES	YES
Macro Controls	YES	YES	YES	YES	YES	YES
Obs.	1,229	2,570	1,452	2,347	2,347	930
Clusters	12	12	12	12	12	12
Pseudo R2	.1350	.1624	.1420	.1620	.1548	.1277

z-Statistics in parentheses; * / ** / *** significant at 10 / 5 / 1 percent; Education (years) distinguishes by the years of education: (1) considers individuals with 0 to 11 years, (2) individuals with more than 11 years; Education (degree) distinguishes by degree: (3) considers individuals with no formal and lowest formal qualification, (4) individuals with above higher secondary level and university degree; (5) considers individuals with relative low income, (6) individuals with relative high income.

offshoring on individual job satisfaction can be found for both groups.

Checking further robustness, we replace the trade freedom index provided by the Heritage Foundation by two alternative measures. Because the empirical measurement of trade policy is intensively discussed in the economic literature (see, e.g., Anderson and Neary 1994; Rose 2004; Dluhosch and Horgos 2013) it is necessary to test whether our results also hold when including alternative proxies for trade policy. Notably, our results are invariant to the particular trade freedom index that is being used: Table 6 displays results when using the trade freedom index provided by the Fraser Institute or the KOF globalization index as alternative proxies for liberal trade policy. In all variants offshoring is positively correlated with individual job satisfaction at high levels of statistical significance. However, when using the two alternative measures, results of the outward FDI variable are no longer statistically significant. The reason for this finding is the structure of the two alternative measures. Both of them include restrictions on capital flows, which grab variance from the outward FDI variable.

To prove that results do not primarily depend on the specific logit estimator that is used for the regressions presented above, we additionally estimate the whole set of regressions

using probit estimations. Here, as well, results lend support to our initial findings. High offshoring activities of a country correlate positively with job satisfaction as individually perceived. The estimated coefficients of a more liberal trade policy, greater openness and larger outward direct investment have significant negative signs. As mentioned above, it is import penetration that is the main driving component in the positive effect of the offshoring index. Probit results also show that the main effect is rooted in service offshoring.

Finally, several of the individual control variables are measured at an ordinal scale. Although this is not significantly biasing results, this does not square well with the fact that the exogenous variables in logit and probit-models are assumed to be metric. Therefore, a final set of robustness checks replaces the ordered exogenous variables by their (metric) dummy-variable counterparts. Results are robust.[14]

5. Conclusions

Previous research on the globalization of production and labor almost exclusively focused on wages and distributional consequences for skill levels, occupations, sectors, industries or even firms. Surprisingly less information is on the table as to the psychological consequences and various indicators of subjective well-being. This deficiency is all the more striking since psychological and sociological research has shown that subjective well-being need not move in tandem with incomes. The question thus arises as to how job satisfaction is affected, in particular with respect to those, whose tasks are more easily susceptible to offshoring and to restructuring and who might be subject to adverse income effects. On the face of it, the answer seems to be straightforward: accordingly, low-skilled labor suffers a decline in job satisfaction in the process of offshoring – not the least because offshoring is thought to have a bias towards low-skilled labor and thought to diminish income perspectives.

However, this notion does not stand the test. We show that the picture is much more diverse with the various dimensions of international competition affecting subjective well-being

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[14]Tables for the additional robustness checks (as to the trade freedom index, logit and probit estimates and metric counterparts) can be obtained from the authors upon request.

quite differently. While some indicators of international trade support conventional beliefs, our results show that job satisfaction actually improves with offshoring. And, we are able to trace these subjectively positive effects of offshoring back to changes in job characteristics.

In effect, our approach is novel in two respects. First, we develop a model that is capable of capturing and thus explaining job satisfaction in conjunction with the income and distributional effects of offshoring and the globalization of production. These theoretical considerations indeed suggest that even those, who remain employed but who suffer from intensifying competition from abroad and from more tasks being offshored may actually be more satisfied with their jobs. Second, we take our theoretical results to the data. As to our main variables, job satisfaction and offshoring activities, we use information from the ISSP and the European IO Database. And, we tap the PWT and the World Bank's WDI, in an attempt to control for variables other than offshoring that might influence job satisfaction. Running a cross-section logistic regression model that combines this information, lends support to our theoretical results. Accordingly, job satisfaction is on average rated higher in countries with comparatively high offshoring activities. This result proves to be robust in several variants of the empirical setup and the data. Hence, accounting for subjective well-being yields new insights and opens up substantially different perspectives on offshoring.

The approach lends itself to an number of extensions. One question is certainly whether there is a notable difference between offshoring in general and trade within GVCs in particular. Their competitive effects may differ, and so may their impact on job satisfaction. Established links, which are already embedded into existing production networks, such as in GVCs, may more easily accommodate shocks and shifts in the geographical distribution of production which in turn may affect job satisfaction. And, other than offshoring per se, GVCs may strengthen complementarities as opposed to substitution effects. Another promising route for further research is the multifaceted nature of job satisfaction and the seemingly different situation as to the various components displayed, for instance, in (East) Asian and

Western data and whether those differences find any correspondence in trade data. Trying to identify geographical, cultural, organizational or institutional differences may deliver additional information on important intervening variables or even policies in the nexus between international competition and job satisfaction.

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Appendix 1

Suppose the world economy's endowment is a scaled version of Home with scaling factor $(1 + A)$ and with $A > 1$. World consumption of goods 1 and 2 is then $C_{1,W} = \theta (1 + A) (L + H) / p_1$ and $C_{2,W} = (1 - \theta) (1 + A) (L + H) / p_2$ respectively, which are thus the corresponding aggregate demand schedules to those in Home in eq.(7).

And, with trade, markets in final goods and intermediates are cleared, now, however, with reference to global supply and demand

$$X_{1,H} + X_{1,F} = C_{1,W}$$

$$X_{2,H} + X_{2,F} = C_{2,W}$$

$$z_H + z_F = Z. \tag{9}$$

The intermediates sector thus faces demand $Z = \beta\theta (1 + A) (L + H) / p_Z$, now with large Z denoting global supply in intermediates in contrast to supply (demand) at Home and Foreign, z_H and z_F respectively. Because of the economies of scale in the production of intermediates, the intermediates sector will be geographically concentrated. With average cost pricing

$$p_Z = w_H + F/Z, \tag{10}$$

(world) demand for intermediates can be written as a function of the (relative) wage of the high-skilled w_H:

$$Z = (\beta\theta (1 + A) (L + H) - F) / w_H \tag{11}$$

Note that the high-skilled wage is crucial, although the intermediates themselves entail services of both, low- and high-skilled labor. This is because, qua assumption, their production requires low-skilled labor input from the numéraire sector which makes for fixed costs; high-skilled labor services are responsible for variable costs. Recalling that quantities have to add up and markets are cleared via trade, i.e. eq.(9), zero profit conditions yield employment

in sector 1 at Home and abroad:

$$L_{1,H} = (p_1 X_{1,H} - p_Z z_H) / \alpha$$

$$L_{1,F} = ((\theta (1 + A) (L + H) - p_1 X_H) - p_Z (Z - z_H)) / \alpha \tag{12}$$

which, by use of eqs.(11) and (10), add up to the world's low-skilled employment in sector 1

$$L_{1,W} = (1 - \beta) \theta (1 + A) (L + H) / \alpha. \tag{13}$$

Its allocation across countries, eq.(12), however, depends on the (endogenous) variables w_H, Z and p_Z. The values of these variables are determined by trade and market clearing in the numéraire:

$$X_{0,W} = (w_L - p_1 c_1 - p_2 c_2) (1 + A) L + (w_H - p_1 c_1 - p_2 c_2) (1 + A) H + F$$

with individual demand schedules $c_1 = \theta/p_1$ and $c_2 = (1 - \theta)/p_1$ according to eq.(7) and with $w_L = \alpha$. Inserting these individual demand schedules, and recalling supply in the numéraire being a linear function of the complement in low-skilled employment $L_{1,W}$ according to eq.(13), that is, $X_{0,W} = \alpha ((1 + A) L - L_{1,W})$, allows to solve for the high-skilled wage

$$w_H = \frac{((1 - (1 - \beta) \theta) (1 + A) (L + H) - F)}{(1 + A) H}. \tag{14}$$

Because supply in good 2 is linear in H_2, its price p_2 equals wages for the high skilled. With wages w_H according to eq.(14), global supply and demand of Z can be derived by drawing on eq.(11):

$$Z = \frac{(\beta \theta (1 + A) (L + H) - F)}{((1 - (1 - \beta) \theta) (1 + A) (L + H) - F)} (1 + A) H \tag{15}$$

Inserting the global output of intermediates, Z, thus derived into eq.(10) yields the price at which intermediates are traded in the integrated world economy as

$$p_Z = \frac{((1 - (1 - \beta)\,\theta)\,(1 + A)\,(L + H) - F)}{(1 + A)\,H} \tag{16}$$

Results thus far already deliver on various insights: derivatives of eqs.(15) and (16) with respect to $(1 + A)$ show that the global use of intermediates increases in the size of the global economy $(1 + A)$, and with the intermediates traded at lower prices while wages for the higher skilled in terms of the numéraire increase, as does the price of good 2

$$\frac{\partial Z}{\partial (1 + A)} = \frac{((1 - \theta)\,E)\,\beta\theta E + (\beta\theta E - F)^2}{((1 - (1 - \beta)\,\theta)\,E - F)^2} H > 0$$

$$\frac{\partial p_Z}{\partial (1 + A)} = -\frac{\beta\theta\,(L + H)^2\,F\,(1 - \theta)}{(\beta\theta E - F)^2} H < 0$$

$$\frac{\partial w_H}{\partial (1 + A)} = \frac{\partial p_2}{\partial (1 + A)} = \frac{F}{(1 + A)^2\,H} > 0$$

with $E \equiv (1 + A)\,(L + H)$ denoting the world's endowment with low- and high-skilled labor and with the sign unambiguous because of footnote 5 and $0 < \theta < 1$ a priori. The fact that the price of intermediates decreases in the size of the trading area means that the IT-sector in whichever is the larger country enjoys a head-start thus attracting all of the business. This information allows to derive employment H_Z in the respective country. The zero-profit condition of the IT-sector in conjunction with the demand schedule faced by the IT-sector and wages for the skilled with trade yields

$$H_Z = \frac{p_Z Z - F}{w_H} = \frac{(\beta\theta\,(1 + A)\,(H + L) - F)}{((1 - (1 - \beta)\,\theta)\,(1 + A)\,(H + L) - F)}\,(1 + A)\,H \tag{17}$$

With total employment of high skilled labor in the world economy at $(1 + A) H$, eq.(17), also

yields aggregate employment in sector 2 as:

$$H_{2,W} = \frac{(1 - \theta)(1 + A)^2 H (H + L)}{((1 - (1 - \beta)\theta)(1 + A)(H + L) - F)} \tag{18}$$

To illuminate the geographically disaggregated implications requires to focus again on

each country individually and on Home in particular. Supposing that Foreign holds a larger

market than Home thus implies that

$$H_{2,H} = H \quad \text{and} \quad H_{2,F} = \frac{((1 - \theta) A - \beta\theta)(1 + A)(H + L) + F}{((1 - (1 - \beta)\theta)(1 + A)(H + L) - F)} H \tag{19}$$

The denominator is positive. A sufficient condition for $H_{2,W}$ to be positive as well it thus

$A > \beta\theta/(1 - \theta)$. However, because $A > 1$ for the IT-sector being located abroad, the

inequality reduces to $(1 - \theta) > \beta\theta$ or β sufficiently small for any given θ.

Now, consider the situation in the sectors producing good 1: the isoelasticity of demand

(and thus supply if markets are cleared) implies that employment $L_{1,H}$, $L_{1,F}$ in Home and

Foreign differs by factor A. From which follows in conjunction with the zero-profit conditions

in Home and in Foreign that sector-specific output differs by factor A as well. The same

holds for the demand for intermediates z_H, z_F: recall that profit maximization in industry 1

in Home and abroad yields the first order conditions

$$p_Z = \frac{\beta p_1 X_{1,H}}{z_{1,H}} \quad p_Z = \frac{\beta p_1 X_{1,F}}{z_{1,F}} \tag{20}$$

Now, because prices of intermediates are equalized by trade according to eq.(16), it must be

the case that the use of intermediates differs by factor A as well. However, if $z_{H,W} = z_{F,W}/A$

with $z_{F,W} = (Z - z_{H,W})$, inserting Z as given by eq.(15) yields the use of intermediates in

Home:

$$z_{H,W} = \frac{(\beta\theta E - F)}{((1 - (1 - \beta)\theta) E - F)} H \tag{21}$$

with E denoting again global endowment in high- and low-skilled labor. Notably,

$$\frac{\partial z_{H,W}}{\partial (1+A)} = \frac{(1-\theta)(L+H)HF}{((1-(1-\beta)\theta)E-F)^2} > 0$$

which means that the use of intermediates increases in tandem with trade and so does their use relative to low-skilled employment $L_{1,H}$. This follows directly from the fact that the use of intermediates increases in the size of the trading area whereas (local) low-skilled employment in sector 1 does not. The same holds for the use of intermediates per unit of local production in good 1. Hence, each unit is produced with less local low-skilled labor and more IT-intensive intermediates as the trading area increases.

Finally, price and quantity of good 1 as well as the geographical distribution of its production follows again from the isoelasticity which implies that $p_{1,W}X_{1,W} = \theta(1+A)(H+L)$. Solving for $p_{1,W}$ and inserting values for $X_{1,W}$, that is, $Z^\beta L_{1,W}$ according to eqs.(15) and (13) yields

$$p_{1,W} = \frac{\alpha}{(1-\beta)\left(\frac{(\beta\theta(1+A)(H+L)-F)}{((1-(1-\beta)\theta)(1+A)(H+L)-F)}(1+A)H\right)^\beta} \tag{22}$$

Because the derivative of the fraction in the denominator is positive with

$$\frac{(1-\theta)(H+L)F}{((1-(1-\beta)\theta)(1+A)(H+L)-F)^2} > 0 \tag{23}$$

the price of good 1 declines with the enlargement of the market. Inserting $p_{1,W}$ into the individual demand schedules $c_{1,W}$ results in

$$c_{1,W} = \frac{\theta}{\alpha}(1-\beta)\left(\frac{(\beta\theta(1+A)(H+L)-F)}{((1-(1-\beta)\theta)(1+A)(H+L)-F)}(1+A)H\right)^\beta \tag{24}$$

of each individual independent of location and skill level. Note that because of $p_2 = w_H$ which is given by eq.(14), individual demand $c_{2,W}$ for good 2 amounts to

$$c_{2,W} = \frac{(1-\theta)(1+A)H}{((1-(1-\beta)\theta)(1+A)(H+L)-F)} \tag{25}$$

And, $w_L = \alpha$ together with the isolelastic demand functions $c_{1,W}p_{1,W} = \theta$, $c_{2,W}p_{2,W} = (1-\theta)$ yields individual demand for the numéraire of the representative L_1-worker as

$$c_{0,W,L1} = \alpha - 1 \tag{26}$$

Knowing consumption levels of all goods prior to integration and in the larger trading area as well as the change in intermediates intensity then allows to calculate job satisfaction according to eq.(5) before and after the offshoring-outsourcing effect with the net effects shown in Fig.1 and for parameter values in footnote 6.

Appendix 2

Table 6: List of Countries Covered by the Data Set

Country	ISSP (1)	Macro Controls (2)	Trade Policy (3)	Openness (4)	FDI (5)	Offshoring (6)
Australia	✓	✓	✓	✓	✓	.
Belgium / Flanders	✓	✓	✓	✓	✓	✓
Bulgaria	✓	✓	✓	✓	✓	.
Canada	✓	✓	✓	✓	✓	.
Cyprus	✓	✓	✓	✓	✓	.
Czech Republic	✓	✓	✓	✓	✓	.
Denmark	✓	✓	✓	✓	✓	✓
Dominican Republic	✓	✓	✓	✓	.	.
Finland	✓	✓	✓	✓	✓	✓
France	✓	✓	✓	✓	✓	✓
Germany	✓	✓	✓	✓	✓	✓
Great Britain	✓	✓	✓	✓	✓	.
Hungary	✓	✓	✓	✓	✓	✓
Ireland	✓	✓	✓	✓	✓	✓
Israel	✓	✓	✓	✓	✓	.
Japan	✓	✓	✓	✓	✓	.
Latvia	✓	✓	✓	✓	✓	.
Mexico	✓	✓	✓	✓	✓	.
New Zealand	✓	✓	✓	✓	✓	.
Norway	✓	✓	✓	✓	✓	✓
Philippines	✓	✓	✓	✓	✓	.
Portugal	✓	✓	✓	✓	✓	✓
Russia	✓	✓	✓	✓	✓	.
Slovenia	✓	✓	✓	✓	✓	✓
South Africa	✓	✓	✓	✓	✓	.
South Korea	✓	✓	✓	✓	✓	.
Spain	✓	✓	✓	✓	✓	✓
Sweden	✓	✓	✓	✓	✓	✓
Switzerland	✓	✓	✓	✓	✓	.
Taiwan	✓	.	✓	✓	.	.
United States	✓	✓	✓	✓	✓	.
Sum	31	30	31	31	29	12

Data: The data consists of the ISSP 2005: Work Orientation III (all individual variables), the PWT and WDI (macroeconomic control variables), Trade Policy Information from the Heritage Foundation, the Fraser Institute and the KOF Globalization index, Openness (taken from the PWT) and Offshoring information for European countries (calculated from input-output date provided by Eurostat).

Table 7: Distribution of Individual Job Satisfaction

Parameter Value	Freq.	Percent	Cum.
Completely Dissatisfied	262	1.06	1.06
Very Dissatisfied	486	1.97	3.04
Fairly Dissatisfied	1,285	5.22	8.26
Neither Satisfied Nor Dissatisfied	2,677	10.87	19.13
Fairly Satisfied	9,449	38.38	57.51
Very Satisfied	6,987	28.38	85.89
Completely Satisfied	3,473	14.11	100.00

Data: ISSP 2005: Work Orientation III

Table 8: Effects of International Trade on Individual Job Satisfaction

Endogenous Variable: Individual Job Satisfaction
Full Set of Variables, Including all Individual and
Macroeconomic Controls.

	(1)		(1 cont.)
job security	.1614***	GDP p.c. (log)	.8377***
	(5.99)		(2.88)
high income	.3748***	Population (log)	.0020
	(9.79)		(0.02)
interesting job	.9837***	Unemployment	.0142
	(12.36)		(0.44)
independent job	.1971***	Trade Freedom	−.0389**
	(6.79)		(−1.94)
exhausting job	−.3016***	Openness	−.0104***
	(−6.48)		(−4.89)
hard work	.0590*	Outward FDI	−.0409**
	(1.86)		(−2.12)
stressful job	−.3202***	Offshoring	5.8098***
	(−10.57)		(3.18)
male	−.1431**	Obs	3,799
	(−2.40)		
age	−.0313	Clusters	12
	(−1.42)		
age^2	.0004	Pseudo R2	.1493
	(1.27)		
married	−.1372		
	(−0.56)		
widowed	.4192		
	(1.31)		
divorced	.1089		
	(0.47)		
single	.0216		
	(0.09)		
cohabiting	−.0335		
	(−0.46)		
education (years)	−.0328**		
	(−1.95)		
education (degree)	−.0613		
	(−1.10)		

z-Statistics in parentheses; * / ** / *** denoting statistical significance
at the level of 10 / 5 / 1 percent.

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