

We observe a strong decline in union density for all sector groups in Austria, France, Germany, the UK and the US, while the decline is more moderate, albeit still visible, in Italy, Denmark and Sweden. Union density stagnated or even increased in Spain between 1980 and 2010, however not exceeding the comparatively low level of 20 percent.<sup>40</sup> In most countries union density began to decrease in the 1980s, with the exception of Austria, France and the US where it has been declining since the 1970s. Union density is highest in manufacturing sectors and lowest in low skilled service sectors. However, the latter group is also characterised by the smallest reduction in union density. Comparing countries amongst each other union density measured at the country level declined most strongly in Austria where we observe a reduction by 35 percentage-points between 1970 and 2011, followed by the UK and Germany where the reduction constitutes 24 and 18 percentage-points respectively.

Adjusted collective bargaining coverage also falls in most countries. The most drastic reductions in bargaining coverage can be observed in the UK, Germany and the US where it declined by 48, 27 and 18 percentage-points between the 1970 and the 2010s.

We observe an increase in social government spending in our sample period in most countries with the exception of Sweden and Denmark where the measure stayed roughly constant. Interestingly, while social government spending increased or stagnated, it's financing is more relying on workers income as can be observed by the increasing implicit tax rates for labour and consumption for all our sample.<sup>41</sup>

Personal inequality measured by the Gini coefficient increased in most countries with regard to its level in the 1980s, with France as the only outstanding exception. A similar pattern can be observed for the income share of the top 1 percent, this time Denmark being the exception from the rule of increasing top income shares.

#### 4. Estimation Methodology

Our basic specification of the within sector wage share has the following form:

$$\begin{aligned}
 WS_{i,t} = & \alpha_i + \alpha_g GROWTH_{i,t} + \alpha_k KnonICT_{i,t} + \alpha_{kict} KICT_{i,t} + \\
 & + \alpha_{barg} BARGAINING_{i,t} + \alpha_{glob} GLOBAL_{i,t} + \alpha_{welfare} WELFARE_t + \\
 & + \alpha_{financial} FINANCIALISATION_t + \alpha_{ineq} INEQUALITY_t + \varepsilon_{i,t} \quad \text{Equation (3)}
 \end{aligned}$$

where  $i$  is the sector index,  $t$  is the time index, and  $WS$  is the wage share in sector  $i$ .  $GROWTH$  is the first difference of value added of the sector in order to control for the counter-cyclical dynamics of the wage share.  $KICT$  and  $KnonICT$  are ICT (information and communication technology) and

non-ICT capital services as a ratio to value added in sector  $i$ ; these capture the effects of technological change.  $\alpha_i$  is a sector specific coefficient. We do not include period effects in our baseline estimation since several of our bargaining variables are only available on the country level and are thereby statistically similar to year dummies while carrying more meaningful information.

*GLOBAL* is a set of variables which capture the effects of globalisation, such as intermediate import penetration and inward and outward FDI intensity. Intermediate import penetration is clearly linked to the wage share insofar as intermediate imports are related to the process of outsourcing to foreign companies. However, our data for intermediate imports is based on the conversion of commodity indices to sector indices and thereby doesn't allow us to calculate how much of the imported product is actually used by each sector, which would constitute a more precise outsourcing measure and requires the use of input-output tables. However, assuming that the use of imported goods stays relatively constant across sectors intermediate import penetration is a relevant measure for the reallocation of production abroad. We expect a negative effect on the wage share for low skilled sectors in capital abundant countries (as high-income OECD countries are usually assumed to be), brought about either by downward pressure on wages to maintain competitiveness, through trade-induced labour-saving technological change, or a reallocation of employment abroad or towards more capital-intensive sectors in the economy.<sup>42</sup> The expected effect for high skilled sectors is more ambiguous, given that imports can also increase output if they are complementary to domestic production or reduce costs. The effect is theoretically even more ambiguous if one considers imports of final goods that are not produced domestically.<sup>43</sup> Depending on which factor is the most dominant, effects are likely to differ across countries.

We focus on outward FDI since it is clearly linked to developments in the wage share while the effect of inward FDI is more ambiguous, and less relevant for developed economies. Furthermore, estimations with inward FDI didn't change our results for outward FDI and the coefficient was not robust. We generally expect the effect of outward FDI to vary across manufacturing and services and potentially across skill groups. FDI is generally classified into two categories: vertical or cost-seeking FDI leads to substitution of domestic, usually low skilled workers by foreign labour, thereby creating negative employment effects in the home country while also increasing intermediate imports. However, there might be a positive scale effect related to vertical FDI if it increases exports through cost advantages or for production purposes in foreign affiliates. Additionally, cost-seeking FDI might have an impact on the factor composition since the type of jobs created abroad are potentially of a low skilled nature, thereby lowering the

wage share of low skilled domestic workers and increasing it for high skilled workers. Furthermore, vertical FDI potentially induce downward pressure on wages as foreign workers can be argued to increase labour demand at lower wage rates. This channel is most likely to impact both skilled and unskilled workers alike. Horizontal, or market-seeking FDI can also have a negative effect to the extent that it replaces exports. More likely though it will have a positive effect for high skilled workers because of an increase in employment at headquarters situated in the home country.<sup>44</sup> Generally, we expect these effects to be less pronounced in services because of their non-tradable character.

Furthermore we test the robustness of our results with regard to globalisation with country-level variables like the KOF globalisation index supplied by Dreher (2006) and Dreher, et al. (2008). These controls, which are important because the variable constitutes an exogenous measure of globalisation, strongly confirm our results with sector level variables.<sup>45</sup>

Our final variable accounting for trends in globalisation is the share of migrant workers in total employment. Previous findings suggest the effect of migration on the wage share to be negligible.<sup>46</sup> Theoretically, it can be either positive or negative depending on whether foreign workers complement domestic workers and thereby increase productivity or replace domestic workers while receiving a lower wage (or lower social security contributions).

*BARGAINING* is a set of variables related to the industrial relations and labour market institutions including union density (alternately at the country and sector level) and adjusted collective bargaining coverage at the country level. While union density measures “potential union bargaining pressure”, “the effectiveness of unions in providing and defending minimum standards of income and employment” is argued to be better captured by bargaining coverage defined as employees covered by collective (wage) bargaining agreements as a proportion of all wage and salary earners in employment with the right to bargaining.<sup>47</sup> Furthermore we experimented with a measure of minimum wages as a ratio to the sectoral average wage as well as the growth rate of real minimum wages. Theoretically, an increase in any of those measures is expected to increase the real wage which will lead to an increase in the wage share if the elasticity of substitution between capital and labour is less than unity.

*FINANCIALISATION* includes interest and dividend payments and income as a ratio to total resources of nonfinancial corporations, as well as household debt as a share of GDP at the country level. There are different channels through which financialisation is said to impact the wage share. Post-Keynesian literature emphasises the effect of financial payments of non-financial corporations and relate it to an increase in the mark-up of employers if the latter is cost-sensitive with respect to financial pay-

ments.<sup>48</sup> Alternatively one could argue that dividend payments are an indication of increasing “shareholder value” orientation, inducing a “downsize and distribute” strategy that will suppress wages and employment.<sup>49</sup> Household debt has been found to reduce wage share arguably through increasing financial vulnerability that has an adverse effect on workers’ willingness to engage in collective action.<sup>50</sup>

*WELFARE* is social government spending at the individual level as explained in the previous section. This variable is measured at the country level and is the same for all sectors.

*INEQUALITY* is country level inequality measured as the Gini coefficient or the income share of the top one percentile, again the same for all sectors.

We apply two main estimation techniques. Our baseline estimation is performed using the within estimator (also referred to as Fixed Effects Estimator), while we estimate the variance-covariance-matrix of the remainder error term using the approach developed by Driscoll and Kraay (1998). Therefore, standard errors are fully robust with respect to serial correlation within countries, cross-sectional correlation across sectors as well as general heteroscedasticity. Our main robustness controls are conducted with a first difference estimator. This has the additional advantage that potential non-stationarity concerns are taken care of given that all our variables are unambiguously stationary in first differences.<sup>51</sup>

Since there is reason for concerns regarding the endogeneity and specifically reverse causality for our measures of technological change and globalisation, and because the effect of other variables will most likely be manifested with a time lag, all explanatory variables enter the equation with a lag. It would be preferable to employ a General Method of Moments estimator to tackle the issue of endogeneity as well as the dynamic nature of the wage share. However, due to the limited number of cross sections in our single country estimations this estimation method is not appropriate. With regards to endogeneity concerns we employ the second best approach by using lagged values of the explanatory variables.<sup>52</sup> In addition to the pool of all sectors, separate regression analysis will be performed for sector groups disaggregated as high skilled and low skilled sectors in manufacturing and services separately.

In separate regressions we employ four alternative measures of the wage share for robustness check: i) the after tax wage share calculated as explained in the previous section; ii) compensation of employees as a ratio to value added, i. e. the wage share without the adjustment for self-employed workers; iii) wages and salaries as a ratio to value added – this is a measure of primary market distribution since it excludes all redistribution measures including social security contributions; iv) a sample without the outliers in which we drop all observations where the wage share exceed 1.

If not otherwise mentioned in the text our baseline results are confirmed by these robustness tests.

We aim at using our variables at the most disaggregated level for which data are available. While our dependent variable is available at the two digit level of ISIC 4 (International Standard Industrial Classification of All Economic Activities), most of our explanatory variables are available at the 1-digit level with the exception of total capital stock and intermediate import penetration which are available at a 2-digit level. For this reason we switch between the two and one digit level according to the specification as explained in the next section.

Estimation period differs due to data availability depending on the variables used in each specification and country. While data for the wage share at sectoral level is available for 1970-2011, the data for the FDI starts only in 1985 and detailed data on imports disaggregated as intermediate and final imports starts in 1995. The estimation period for Austria and most other countries is 1996-2010 for specifications including intermediate imports and 1986-2010 for specifications including FDI, with the exception of Denmark where our sample finishes in 2011. Furthermore, data for our measures of financialisation starts in 1995 for Austria and most other countries with the exception of France where data is available from 1970. It is mostly data on the capital stock that constrains the last year of our sample period, although for some countries, like the US, data for the sector-level wage share also ends in 2010.

We exclude the Agriculture, Hunting, Forestry and Fishing, and Mining and Quarrying sectors as well as mostly publicly owned sectors (Public Administration and Defence, Compulsory Social Security, Education, Human Health and Social Work Activities) from the reported estimations, as these sectors' wage setting behaviour may constitute an outlier and may not be determined by the same forces as in other sectors, but results are robust to the inclusion of these sectors.

## 5. Estimation Results

Table 1 shows estimation results for Austria for the total sector pool, while the reader is referred to Guschanski and Onaran (2016a) for estimation differentiated by skill group and manufacturing and service sectors.

We estimate specifications (1) to (3) at the 2-digit level while specifications (4) to (8) is estimated at the 1-digit level. We separately estimate the effect of increasing import penetration and outward FDI on the wage share, while controlling for union density and individual government spending at the country level in specifications (1) to (6). To avoid multicollinearity we estimate specifications with union density and government