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ABSTRACT
There are two main political economy explanations of the Eurocrisis. The labor market view regards cross-country differences in wage bargaining institutions as the root cause of the crisis. The finance view, instead, emphasizes cross-border financial flows and downplays labor market institutions. For the first time, we attempt to assess these two explanations jointly. We find that financial flows are better predictors of nominal wage growth than labor market institutions. At the same time, we show that wage moderation matters for bilateral export performance in the important case of Germany, but not for other countries. These results suggest that imposing wage moderation and labor market reforms onto the countries of the European periphery was unlikely to improve their plight. In contrast, stimulating wage growth in Germany might have contributed to rebalancing the Eurozone.

Introduction

This paper deals with the role that wage dynamics have played in the Eurozone crisis. Two very different views have been proposed on this theme: one puts the emphasis on wage bargaining institutions, the other on financial developments. Our goal is to consider these two explanations jointly and differentiate them both conceptually and empirically.

The first view, which we refer to as the 'labor market view', emphasizes asymmetric wage dynamics as the root cause of the Eurocrisis, and attributes the asymmetries to the the coexistence of very different wage setting institutions in the Eurozone (e.g. Carlin & Soskice, 2014; Hancke, 2013b; Höpner & Lutter, 2018; Johnston et al., 2014; Johnston & Regan, 2016; Scharpf, 2011). Specifically, it argues that countries like Germany and other northern countries are equipped with coordinated wage bargaining systems with the ability to produce wage restraint, while uncoordinated wage bargaining systems in southern European countries produce the opposite result. These trends lead to unit labor costs (ULCs) and inflation divergences across member countries (lower relative ULCs in 'core' countries,

higher in 'peripheral' ones), which within a single currency translate into corresponding real exchange rate (RER) depreciation and appreciation, respectively. In turn, these RER movements generate current account surpluses in the north and current account deficits in the south, a signature feature of the Eurozone in the pre-crisis years.

The labor market view is in many ways comparative political economy (CPE)'s distinct contribution to explaining the Eurocrisis. However, other scholars, particularly from international political economy (IPE), have challenged this interpretation and proposed an alternative that downplays the role of labor market institutions and focuses instead on financial developments within the Eurozone. An emphasis on financial flows and a neglect of labor market dynamics also characterizes the economists' 'consensus view' of the crisis (see Baldwin & Giavazzi, 2015).

Proponents of the finance-centered argument criticize the labor market view for ignoring the large cross-border financial flows that the onset of the euro set in motion. They argue that the labor market view reverses the direction of causality. Far from being the prime cause of the crisis, the competitiveness imbalances between north and south were really the consequence of capital movements from the center to the periphery. These capital flows boosted investment in housing and, more generally, led to domestic demand overheat, resulting in wage increases and price inflation in the periphery (Gabrisch & Staehr, 2015; Jones, 2016; Perez, 2019; Schelkle, 2017; Tooze, 2018). The demand overheat brought about competitiveness and current account imbalances just like in the labor market view, but their ultimate cause was finance, not bargaining institutions.

Motivated by this debate, we engage in this paper in two sets of analyses. First, we examine to what extent wage bargaining institutions are able to explain nominal wage developments, controlling for financial flows (credit creation and cross-border capital flows). We find that financial flows are a better predictor of nominal wage inflation than bargaining structure and conclude that by ignoring the financial determinants of wage growth, the labor market view has exaggerated the impact of wage bargaining institutions. In a second set of analyses, we test whether wage developments mattered for trade performance and specifically whether they had the effect of increasing bilateral exports within the Eurozone. We find a statistically significant correlation between trends in relative nominal wages and bilateral export volumes in Germany but not in other countries, including coordinated countries such as Austria and the Netherlands.

These findings suggest the need to move away from black and white arguments about the role of wages in the Eurozone. On the one hand, there is no clear evidence that wage bargaining institutions are responsible for higher wage inflation in the European periphery or lower wage inflation in the European core. At the same time, wages seem to have played an important role for a crucial country in the Eurozone, Germany, where low nominal wage growth seems to have facilitated export expansion, thus contributing to the German current account surplus.

The remainder of the paper is organized as follows. First, we review the debate over labor market-based and finance-based explanations of the Eurocrisis. Second, we analyze the determinants of nominal wage growth in the pre-crisis period, assessing the explanatory power of bargaining structure and financial variables. Third, we examine to what extent nominal wages explain bilateral export flows in Germany and a number of other countries. Finally, we discuss the econometric

results against the backdrop of the emergence of an export-led growth model in Germany.

From wage bargaining to the current account

The relationship between wage bargaining and wage growth is one of the most researched topics in political economy. Under the assumption that wages are determined by labor market institutions, and not just by supply and demand for labor, a vast literature has argued that more coordinated bargaining structures lead to lower wage inflation than uncoordinated bargaining structures (Baccaro & Simoni, 2010; Calmfors et al., 1988; Soskice, 1990; Soskice & Iversen, 2000).

The reason is that when bargaining is coordinated, wage setters are incentivized to take into account the possible undesirable consequences of high nominal wage settlements, i.e. higher inflation, which may discourage investment and/or induce the central bank to adopt a more restrictive monetary policy. However, when wage setters are small enough to think that they are unable to affect the price level, such incentives for wage moderation are absent. The result is either higher wage inflation in uncoordinated bargaining systems or (if the inflation rate is pinned down by independent, inflation-targeting central banks) higher unemployment for a given inflation rate (Hall & Franzese, 1998; Soskice & Iversen, 2000).

A related stream of literature holds that wage outcomes are contingent on the type and composition of actors engaging in coordinated bargaining. If bargaining is coordinated by wage setters in protected sectors, the incentives for wage moderation will be limited or entirely absent. Actors in non-exposed sectors face relatively inelastic labor demand curves and thus are able to shift higher nominal costs onto prices. If, conversely, bargaining is directed by firms and unions that are exposed to international competition, the need for maintaining competitiveness will lead to more moderate wage settlements (Crouch, 1990; Garrett, 1998; Johnston & Regan, 2016). Wage inflation, in turn, is systematically related to price inflation because in oligopolistic labor and product markets, prices are formed by adding a mark-up to unit costs.[1]

Drawing on the arguments summarized above, a literature inspired by the Varieties of Capitalism (VoC) perspective (Hall & Soskice, 2001) has explained the Eurocrisis as the ultimate consequence of incompatible wage bargaining regimes. Coordinated wage bargaining structures in core countries such as Germany, Austria, Belgium, and the Netherlands, as well as in Nordic countries like Finland, produce systematically lower wage inflation than uncoordinated ones in peripheral countries such as the Mediterranean countries (Hancke, 2013a; Hancke & Rhodes, 2005; Hancke & Soskice, 2003). This phenomenon interacts with two key features of the euro—a single nominal exchange rate for all member countries and a single nominal interest rate set by the ECB—to generate divergences in competitiveness and real exchange rates.

When a common exchange rate and a single policy interest rate are combined with country-specific inflation rates, the consequence is that real exchange rates and real interest rates will vary systematically across member countries.[2] This will generate two opposite impulses. A country with lower wage and price inflation will experience RER depreciation relative to other members of the currency area, and its net exports will tend to grow (the magnitude of the effect will depend on how

sensitive they are to the price change). Simultaneously, real interest rates will be higher than in countries with higher inflation. The combination of higher real interest rates and lower real exchange rates will lead to foreign demand stimulation and domestic demand depression, and through this channel to import reduction. The sectoral composition of GDP is likely to be affected as well (Baccaro & Pontusson, 2016), with sectors like construction being penalized due to interest-rate sensitivity of demand. Conversely, the exporting sector—to the extent that it benefits from a competitive real exchange rate—will benefit from the shift. This is vice versa for the combination of lower real interest rates and higher real exchange rates.[3]

The labor market view

In short, the labor market explanation for the Eurocrisis can be summarized as follows. Differences in wage bargaining institutions lead to different growth rates of nominal wages, which (assuming labor productivity is determined exogenously) translate into inflation rate divergences. These in turn lead to real exchange rate disparities that finally generate current account imbalances, with core countries registering current account surpluses and peripheral countries current account deficits.

Existing research in CPE has provided some empirical support for this argument. Early on, Scharpf (2011) drew attention to a striking contrast in the evolution of ULCs between Germany, where ULCs had remained stable or even declined, and the GIIPS (i.e. Greece, Ireland, Italy, Portugal, and Spain), where they had increased starkly. He linked these trajectories to differences in bargaining institutions across countries. Pursuing a similar line of argument, the econometric analysis by Höpner and Lutter (2018) concluded that countries with coordinated bargaining institutions have lower ULCs than countries with uncoordinated bargaining institutions. Most prominently, Hancke (2013b), Johnston et al. (2014), and Johnston and Regan (2016) have argued that the Eurozone witnesses the uneasy coexistence of coordinated systems in which the wage preferences of the exposed sectors dominate and uncoordinated systems that generally lack the ability to produce wage restraint. According to Johnston and Regan (2016), the problem of uncoordinated bargaining systems is specifically located in non-exposed sectors where wage inflation is considerably higher than in the corresponding non-exposed sectors in northern countries (international competitiveness requirements constrain price-setting in exposed sectors everywhere).

Capital flows and competitiveness

There is, however, an alternative—finance-centric—explanation of the phenomena discussed above, which argues that the causality runs from finance to the labor market rather than vice versa (Gabrisch & Staehr, 2015; Jones, 2016; Perez, 2019; Schelkle, 2017; Tooze, 2018). In a nutshell, this alternative argument goes as follows. With European monetary integration, the perceived quality of southern bonds and their risk-return profile improved as a result of the decline in country risk-premia, and savers in the north increased their purchases of southern financial

assets. These purchases took the form of interbank flows from northern to southern banks. Southern banks, in turn, lent the extra reserves to the southern economies. The resulting increase in money supply in the south led to higher inflation and lower real interest rates in the peripheral countries, thus increasing domestic demand, eroding competitiveness and exports, and boosting imports.

It should be noted that cross-border financial flows from the north to the south had once been considered a positive development in the Eurozone and a sign that a welcome process of cross-country convergence was taking place. Cross-border flows would enable less developed countries to invest more than their domestic savings would allow, thus catching up with more developed countries (Blanchard & Giavazzi, 2002). Only later did it become clear that the investments of peripheral countries like Spain and Ireland were mostly in low-productivity sectors like construction and were leading to a deterioration of competitiveness and external positions rather than any catch-up. In any case, in the financial view of the crisis, developments in capital markets, particularly the surge in cross-border banking loans, caused both competitiveness deterioration and capital account surpluses (the mirror image of current account deficits) in the Eurozone periphery (Fuller, 2018). In this alternative interpretation, labor market developments—far from being the driving force—are epiphenomenal to financial developments.

It is important to note that there are two variants of the argument focusing on financial flows and they diverge with regard to the role of foreign vis–vis domestic sources of finance (see Cesaratto, 2017). The first view, summarized above, rests on a mainstream 'loanable fund' theory of credit, according to which for banks to lend money to the private sector, they first have to receive the money from somewhere. This version essentially argues that northern banks exported the savings of northern firms and citizens to southern banks, and that these then used the newly available funds to extend credit to their own private economies.

The second view relies on the heterodox theory of endogenous money (see Chapter 4 in Lavoie, 2014), according to which the supply of credit adjusts endogenously to the demand for it. This implies that provided there is demand for credit supported by adequate collateral (for example because a low real interest rate stimulates construction investment), southern banks have no need to wait for northern funds to arrive in order to satisfy such demand. Rather, they can themselves create all the (scriptural) money that the private sector (in Spain and Ireland) or public sector (in Greece) demands, and are all more likely to do so when real interests rates are low. While the first view of finance underscores cross-border financial flows, the latter puts the emphasis on domestic credit creation.[4]

Wage developments and trade performance

The labor market view and financial view of the Eurocrisis have different positions on where the causal chain begins (in the labor market in the former case, in financial markets in the latter case), but they share the rest of the causal chain: something causes asymmetric developments in nominal ULCs and real exchange rates, which in turn affects competitiveness, exports, imports, and current account balances.

It should be emphasized that such imbalances are not a sufficient condition for the crisis. As argued by De Grauwe (2011) and others, the imbalances would not have caused a sovereign debt crisis if the Eurozone had had a lender of last resort

willing to act as a guarantor of government debt and willing to prevent sovereign bond prices from declining. The ECB was unwilling to play this role until Mario Draghi announced the launch of the Outright Monetary Transactions (OMT) program in the second half of 2012. However, the ECB's ability to cap sovereign bond yields is constrained by both the letter and the spirit of the European Treaties (e.g. Article 123 of the Treaty on the Functioning of the European Union, which prohibits 'overdraft facilities'). Moreover, the ECB made access to OMT contingent on signing a Memorandum of Understanding with the European Stability Mechanism, implying strict conditionality for the crisis country (i.e. austerity policies and structural reforms).

Regardless of the etiology of the crisis, there is an empirical issue that has not been properly addressed by either the labor market or the finance-centric view: how sensitive are trade flows to movements in ULCs? If they are not very sensitive to relative cost and price differences (a position known as 'elasticity pessimism', see Krugman, 2016), then whatever caused the loss of competitiveness in the south (and gain of competitiveness in the north) is not very important overall.

There is no consensus on this issue and the degree of price sensitivity of German exports is especially controversial. A long tradition in political economy sees German exports as relying on a quality—as opposed to cost or price—advantage (Hall & Soskice, 2001; Hope & Soskice, 2016; Horn et al., 2017; Streeck, 1991; Vermeiren, 2017). It is argued that the German institutional system (rigid collective bargaining institutions, high wages, strong employment protection, worker involvement through work councils, codetermination, generous investment in vocational training and in social security) provides for beneficial constraints, which protect German firms from socially disruptive cost competition and force them to innovate (Streeck, 1991).

In a similar vein, Storm and Naastepad (2015a, 2015b) have recently argued that the German export performance has nothing to do with wage moderation and is more appropriately explained by the beneficial effects of non-liberal labor market and corporate governance institutions. German exports, they hold, are not very sensitive to ULCs and even less to wage dynamics. According to these authors, German labor market institutions matter not because they produce wage moderation. Instead, they matter because they strengthen the country's non-price competitiveness (see Chapter 5 in Storm & Naastepad, 2012).

In contrast, Flassbeck and Lapavitsas (2015) regard wage dynamics as key to understanding the Eurocrisis. For these authors, the crucial driver of the crisis is Germany's prolonged wage moderation, not the southern countries' wage militancy (see also Bibow, 2013; Bofinger, 2015). They argue that German wage moderation has had three destabilizing consequences: (1) it has reduced German imports from Eurozone partners by depressing internal demand in Germany; (2) it has caused real exchange rate devaluation in Germany and correspondingly real exchange rate appreciation in other euro countries; and (3) it has generated an excess of savings in Germany, which have then been used to finance current account deficits in the periphery.

Analyzing the role of wage moderation

As the preceding discussion has revealed, there are unresolved issues in the debate over what impact wage dynamics have had in causing the Eurozone crisis. First, it

is not clear whether different degrees of coordination in wage bargaining affect nominal wage changes. The labor market view asserts that they do, but the financial view sees them as the consequence of demand dynamics caused by cross-border financial flows or domestic credit creation. Second, it is not clear to what extent nominal wage changes—independently of what causes them—affect trade flows.

In this empirical section, we seek to address these two issues. First, drawing on previous research, we estimate the determinants of nominal wage growth in the Eurozone. We bring in an important innovation by controlling—to our knowledge for the first time—for the following two financial variables: total credit to the private sector and cross-border financial flows. If bargaining structure has an independent effect, its regression coefficient should survive inclusion of the financial variables. Second, in order to probe whether relative nominal wage trends matter for export volumes, we estimate—again to our knowledge for the first time—bilateral export flows as a function of relative bilateral wage dynamics for Eurozone countries. Since it is far from straightforward to tease out the multiple causality paths between labor markets, financial markets, and demand dynamics, the analysis will have to rely on some identifying assumptions, which we will spell out in due course. In both parts of the empirical analysis, our results are based on 11 of the 12 first euro countries (excluding Luxembourg).[5]

A first descriptive look

We start with a brief descriptive analysis. First, to get a sense of the validity of the labor market view as it pertains to gains in competitiveness, Figure 1 presents time-series boxplots that track overall ULCs in Eurozone countries between 1995 and 2015. ULCs are defined as nominal labor compensation per hour worked normalized by gross value added per hour worked at constant prices. The base year (= 100) is 1999, which is the year when the euro was officially introduced. On top of the individual boxplots, we plot lines for the (average) ULCs in Germany, the remaining core countries (Austria, Belgium, Finland, France, and the Netherlands), and the GIIPS. The data come from the OECD Productivity and Unit Labour Cost by Industry Database (ISIC Rev. 4).

Between 1999 and 2007, ULCs increased in every country of the Eurozone except Germany, where ULCs declined by 4 percent. The loss of competitiveness was particularly pronounced in the GIIPS countries (in 2007: 36 percent in Ireland, 30 percent in Greece, 28 percent in Spain, 23 percent in Italy, 22 percent in Portugal). In the aftermath of the financial crisis, German ULCs grew but Germany, and by some measure, remained the country with the slowest overall ULC growth relative to 1999. In some years, German ULCs were so low compared to other countries that they even formally qualifiy as outliers (see points outside the lower whiskers[6]).

Do higher levels of productivity explain Germany's gains in competitiveness? To shed some light on this question, Figure 2 plots labor productivity (defined as gross value added per hour worked at constant prices) for the same set of countries over the same time period. It becomes immediately clear that Germany did not exhibit exceptional levels of labor productivity. With productivity growth of 16 percent between 1999 and 2007, Germany was in better shape than laggards like Italy and
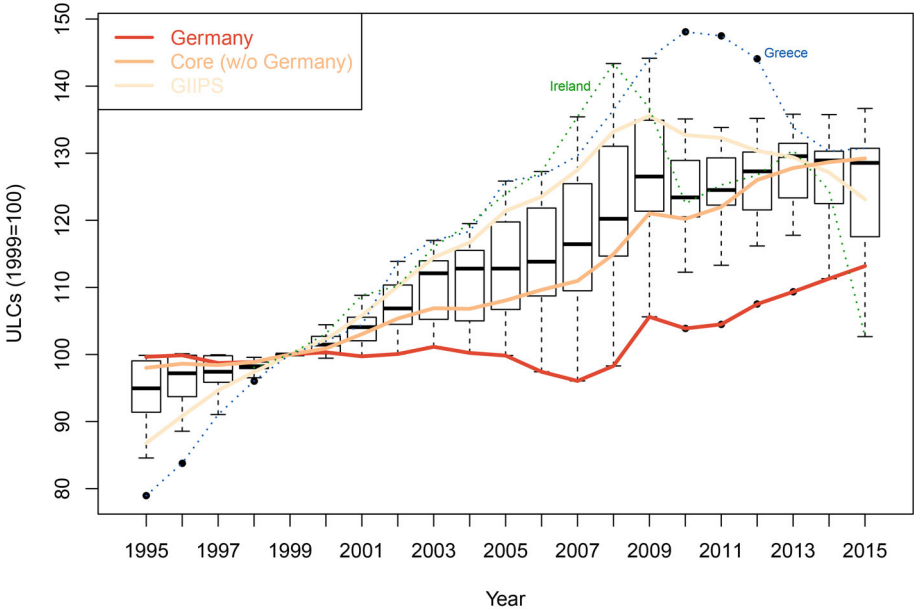
Figure 1. Unit labor costs in 11 euro countries, 1995–2015.
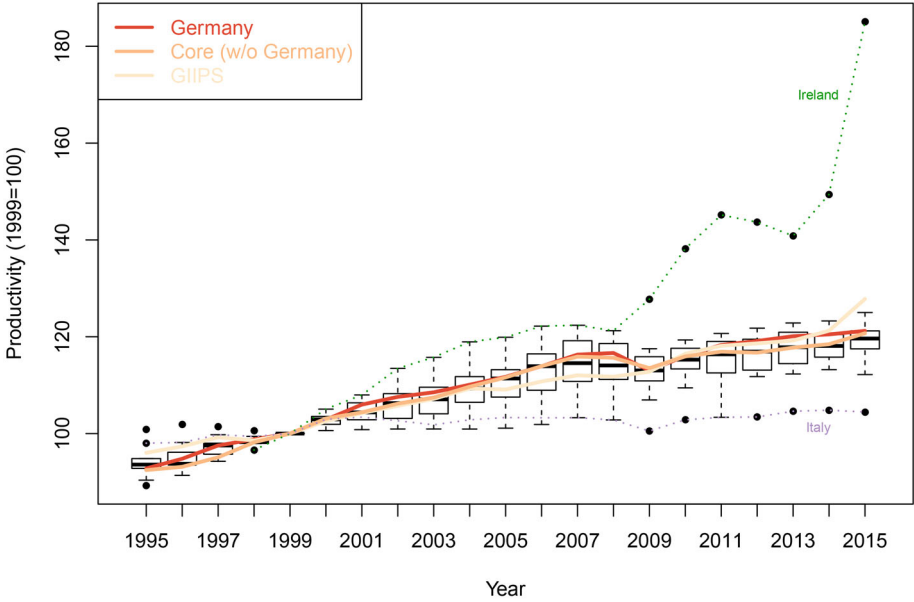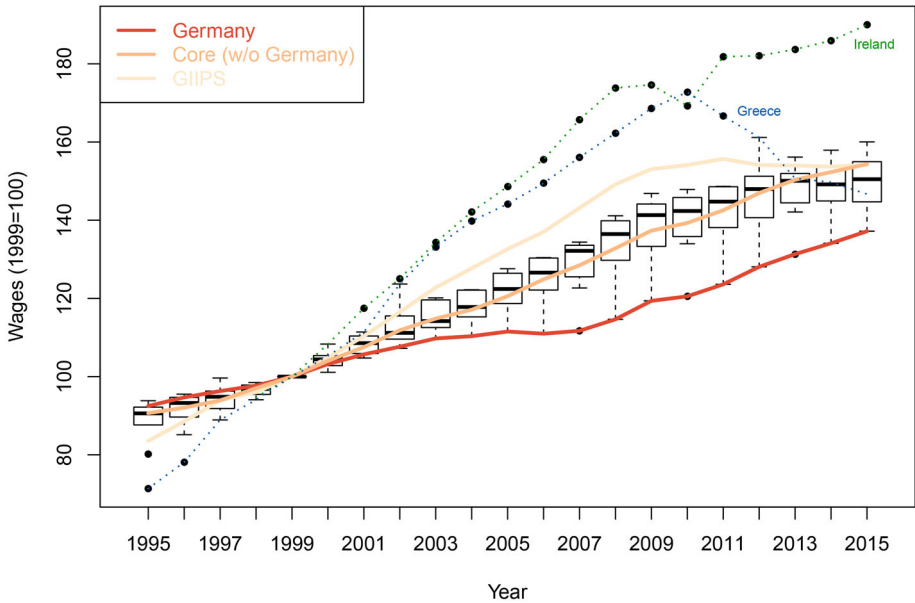

Figure 2. Labor productivity in 11 euro countries, 1995–2015.

Spain (3 percent each) but did worse than France, Ireland, or even Greece (22, 21, and 20 percent, respectively). In short, the data suggest that German competitiveness gains were not due to its comparative productivity growth (and the same holds for trends in manufacturing productivity, see Figure A4).

Figure 3. Nominal wages in 11 euro countries, 1995–2015.

This leaves wages as the only possible explanation. Figure 3 delineates nominal wage rates per hour worked in all sampled countries between 1995 and 2015. The graph shows that wage development in Germany was exceptional. After the introduction of the euro, wages increased in Germany at a much slower rate than in any other Eurozone country. Apart from the first couple of years of the common currency, the German trend was consistently the lowest observed in data. In contrast to the argument of the labor market view, however, the much steeper trend line of the remaining core countries suggests that such low wage growth is not a general feature of all coordinated economies. The difference to Germany is even starker when one looks at the GIIPS. In these countries, wages rose rapidly in the Eurozone and only leveled off after the crisis. Wages escalated especially in Greece and Ireland. Between 1999 and 2007, nominal wages grew by 56 percent in Greece and 66 percent in Ireland. In comparison, Germany registered only a nominal wage increase of 12 percent. We show in the appendix that trends in nominal manufacturing wages (see Figure A5) very much mirror these overall wage dynamics.

Figure 4 provides a first assessment of the validity of the finance view by tracking total credit to the private non-financial sector from domestic banks as a percentage of GDP (from the Bank of International Settlements). In many ways, the resulting picture resembles the ULC and wage dynamics in Figures 1 and 3. Germany, again, exhibits an unusual trend. Between 1999 and 2007, total private credit in Germany decreased by 10 percent. This is the strongest decline of all countries. In fact, besides Belgium (–4 percent), total private credit grew in every other country. This becomes clear from the monotonically increasing average trend of the remaining core. As in the case of nominal wages, total private credit rose most strongly in the GIIPS. On average, total private credit increased by 93 percent in these countries. Credits skyrocketed especially in Greece (141 percent) and Ireland (122 percent).
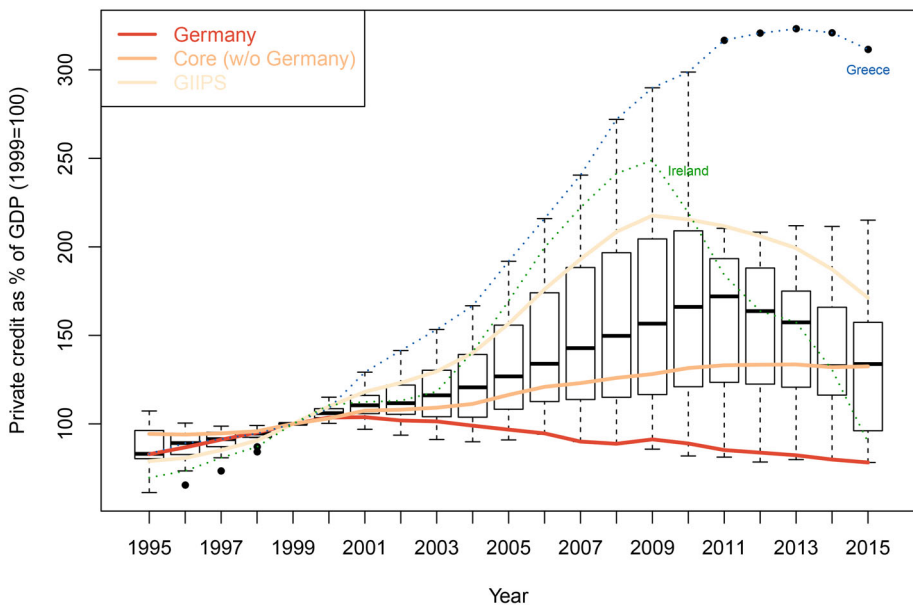
Figure 4. Total private credit as percentage of GDP in 11 euro countries, 1995–2015.

Determinants of nominal wage growth

These descriptive findings suggest that wage and credit creation trends largely overlap in the Eurozone. We next try to disentangle the impact of these two factors. Our key identifying assumption is that nominal wages adjust to changes in demand conditions with a lag. This assumption draws on the lag structure of Carlin and Soskice's three-equation macroeconomic model. While nominal wages do not respond simultaneously to changes in demand conditions in this model (as they are determined by wage setters in 'wage rounds'), prices adjust immediately to a wage change (see especially Carlin & Soskice, 2014, pp. 48–51). Thus, we estimate the following regression equation:

$$\Delta \ln (Wages_t)^* = \alpha + \beta_1 Coordination_t + \beta_2 \Delta \ln (Loans_{t-1}) + \beta_3 \Delta \ln (Credits_{t-1})$$
$$+ x'\gamma + \Delta \epsilon_t.$$

(1)

In words, we regress the first difference of logged nominal wages (equivalent to percentage change) against Visser's index of wage coordination (Visser, 2016), the first difference of the lag of logged loans from nonresident banks as a percentage of GDP (World Bank Global Financial Development Database), and the first difference of the lag of logged total credit to the private non-financial sector from domestic banks as a percentage of GDP (Bank of International Settlements). According to the labor market view, the index of wage coordination should have a negative sign, based on the idea that more coordinated wage bargaining institutions produce nominal wage moderation. By entering both changes in cross-border capital flows and changes in domestic credit creation, we aim at parsing out the relative importance of foreign vis–vis domestic sources of funds. From a finance-

centered perspective, the expected sign of these financial indicators should be positive.

A vector of control variables enters the equation with $x'\gamma$. The vector includes three of the most common economic explanations for wage dynamics (see Blanchard & Katz, 1999). These are lagged changes in the logged inflation rate (based on the consumer price index; OECD Main Economic Indicators Database) as a proxy for the expected inflation rate, lagged changes in logged labor productivity (OECD Productivity and Unit Labour Cost by Industry Database, ISIC Rev. 4), and lagged levels of unemployment (European Commission's Ameco database) as an indicator for labor market tightness. The expectation is that wage growth responds positively to past inflation and past productivity and negatively to unemployment, which discourages wage militancy. In addition to the index of wage coordination, two further institutional controls often used by the political economy literature on the determinants of wages are the partisan control of government (index of cabinet composition where higher values indicate more left-leaning government; Armingeon et al., 2018) and trade union density (Visser, 2016). It is expected that more left-oriented governments may lead to greater wage inflation than right-oriented ones (e.g. Hibbs, 1977), and that union density proxies for the labor market power of workers, which should be linked to faster wage growth. The appendix provides detailed descriptive statistics for all these variables.

The subsequent models are based on our set of 11 countries observed annually between 1999 and 2014. We estimate them by ordinary least squares with panel corrected standard errors that correct for country-specific heteroscedasticity and spatial correlation of errors (Beck & Katz, 1995, 1996). Moreover, we include a Wooldridge test for autocorrelation in time-series cross-section data with the null hypothesis of no autocorrelation (Wooldridge, 2010). Panel unit-root tests suggest that the data are stationary after first-differencing. We test for cointegration using Westerlund panel cointegration tests (Westerlund, 2005). Unable to reject the null hypothesis of no cointegration, we proceed with the first difference specification.

Table 1 presents parameter estimates and standard errors under six different model specifications. Contrary to the expectations of the labor market view, the sign of the coefficient is statistically significantly positive in this sample. In the next model, we add the first of our two financial variables: lagged loans from nonresident banks as a percentage of GDP. This indicator is positive but statistically indistinguishable from zero. In Model 3, we additionally include lagged total private credit as a percentage of GDP. The estimated coefficient is positive and highly statistically significant. The estimate is robust to the inclusion of controls and tells us that for each percentage point increase in total private credit (as a percentage of GDP), nominal wages increase by roughly 0.1 percentage points. The coefficient of cross-border banking flows remains statistically insignificant throughout.

The counter-intuitive result of a positive effect of coordination on nominal wage changes disappears (i.e. becomes statistically insignificant), once we add economic (Model 4) and institutional (Model 5) controls. The economic controls are signed according to expectations and bounded away from zero in all cases. At the same time, none of the institutional variables has any impact on the dependent variable. In the last model, we restrict our sample to the pre-crisis years (1999–2007). Even in this case, the wage coordination variable remains insignificant. In this shorter timeframe, cross-border banking flows become statistically significant when total

Table 1. Determinants of nominal wage growth in the Eurozone, 1999–2014.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Coordination $_t$	.006*	.006*	.005*	.002	.001	−.001
	(.002)	(.002)	(.001)	(.001)	(.001)	(.001)
Δ ln (Loans$_{t-1}$)		.024	.004	.004	.003	−.008
		(.016)	(.014)	(.011)	(.010)	(.013)
Δ ln (Credit$_{t-1}$)			.141*	.106*	.082*	.112*
			(.035)	(.026)	(.025)	(.021)
Δ ln (Inflation$_{t-1}$)				.413*	.381*	.598*
				(.107)	(.095)	(.110)
Δ ln (Productivity$_{t-1}$)				.392*	.338*	.256*
				(.086)	(.079)	(.083)
Unemployment$_{t-1}$				−.150*	−.195*	−.128*
				(.037)	(.038)	(.037)
Partisanship$_t$					.001	.001
					(.001)	(.001)
Union density$_t$					.003	.004
					(.007)	(.007)
Constant	.008	.005	.006	.018*	.022*	.021*
	(.007)	(.007)	(.006)	(.006)	(.007)	(.008)
Observations	176	176	176	173	152	91
H_0: no autocorrelation	.306	.330	.387	.532	.306	.195
H_0: no cointegration	.216	.248	.430	.302	——	——
R^2	.099	.122	.241	.462	.431	.467

*p <.05. Westerlund cointegration tests for Models 5 and 6 are missing because Stata does not allow to run these tests with more than seven regressors.

private credit is not included in the model (not shown). This could suggest that the effect of cross-border loans ran through domestic credit creation in this period (foreign banks lent to domestic banks, which in turn lent to the domestic private sector) and this effect ceased when the crisis hit.

In any case, the crucial finding is that—as suggested by many proponents of the finance view (e.g. Storm & Naastepad, 2016)—total private credit was a major reason for the peculiar wage dynamics, while bargaining structure does not seem to be a significant predictor of wage growth in the Eurozone.[7] In Table A3, we repeat the analysis with nominal manufacturing wages. In contrast to the preceding findings, total private credit is not a significant predictor in the models that use the full sample. However, when we restrict the analysis to pre-crisis years (Model 6), the variable attains statistical significance and the coefficient has a similar size as previously reported. This implies that in the pre-crisis years an expansion of private credit did not just affect wage growth in non-exposed sectors, but also in the manufacturing sector in which wage growth should in theory be moderated by competitiveness requirements.

One reason why we fail to find an effect of wage coordination may be that the effect is heterogeneous across countries. To allow for this possibility, we add—in separate models (one country at a time)—an interaction term between the coordination index and a country dummy. Consequently, this gives us 11 separate models. The interaction term captures the differential effect of a marginal change in bargaining structure in a specific country relative to the marginal effect of bargaining structure in the sample as a whole. In Table 2, we report both the country-specific interactions and the country-by-country linear combinations of the main effect of the wage bargaining coefficient and the country-specific interaction for both the shorter (1997–2007) and longer (1999–2014) samples.

Table 2. The effect of country-specific wage bargaining structures on nominal wage growth, 1999–2007 (short) and 1999–2014 (long).

	Austria		Belgium		Finland		France		Germany		Greece	
	Short	Long	Short	Long	Short	Long	Short	Long	Short	Long	Short	Long
Country–specific coordination												
Linear	−.003*	−.003*	.001	.001	.000	.000	.007*	.006*	−.004*	−.002*	−.000	−.002
	(.001)	(.001)	(.001)	(.001)	(.002)	(.001)	(.002)	(.002)	(.001)	(.001)	(.001)	(.003)
Combination	−.004*	−.002	−.001	.001	−.001	.002	.007*	.008*	−.003*	.000	−.001	−.000
	(.001)	(.001)	(.002)	(.001)	(.002)	(.002)	(.003)	(.003)	(.002)	(.002)	(.002)	(.003)
Remaining variables	Yes		Yes		Yes		Yes		Yes		Yes	
Observations	91	152	91	152	91	152	91	152	91	152	91	152
R^2	.520	.454	.486	.432	.484	.432	.522	.454	.521	.438	.484	.435

	Ireland		Italy		Netherlands		Portugal		Spain	
	Short	Long	Short	Long	Short	Long	Short	Long	Short	Long
Country–specific coordination										
Linear	.004*	.003	.001	.001	.000	−.002*	−.004	−.003	.001	.005*
	(.001)	(.002)	(.001)	(.001)	(.001)	(.002)	(.002)	(.002)	(.001)	(.001)
Combination	.001	.004	−.002	.002	−.001	−.000	−.007*	−.003	−.000	.004*
	(.002)	(.003)	(.002)	(.002)	(.001)	(.001)	(.004)	(.003)	(.001)	(.002)
Remaining variables	Yes		Yes		Yes		Yes		Yes	
Observations	91	152	91	152	91	152	91	152	91	152
R^2	.545	.452	.485	.432	.484	.439	.496	.438	.487	.463

*$p < .05$.

These additional analyses suggest a statistical relationship between wage bargaining coordination and nominal wage growth in the following cases: Austria, France, Germany, Ireland, the Netherlands, Portugal, and Spain. On the one hand, wage bargaining coordination seems to have had a wage-increasing impact in France, Ireland (only pre-crisis period) and Spain (only long series) relative to the effect of bargaining coordination in the sample as a whole. On the other, coordinated wage-setting had a negative effect on nominal wages in Austria, Germany, and the Netherlands (only long series) relative to the sample as a whole. Furthermore, for Austria, Germany, and Portugal, we find a negative total effect of wage bargaining coordination in the pre-crisis period. For France and Spain (only long series), we find a total positive effect. In short, wage bargaining structure is estimated to have an effect on wage growth in several countries but the effect appears highly heterogeneous (when we repeat the analysis with manufacturing wages, we find statistically significant effects in the cases of France, Germany, and Spain; see Table A4).

Impact of wages on exports

For wages to have an impact on exports as postulated by the labor market view, export volumes need to be sensitive to changes in wages and this is a contested proposition as we argued above. To test this hypothesis, we estimate bilateral export regressions for those countries for which we have some evidence that the bargaining structure affects wage growth, i.e. Austria, France, Germany, Ireland, the Netherlands, Portugal, and Spain. The regressions examine whether these countries' bilateral exports to and from other euro countries in our sample are affected by relative changes in wages. The basic regression equation has the following form:

$$\Delta \ln \left(Exports_{c,p} \right)^* = \alpha \quad + \beta_1 \Delta \ln \left(\frac{Wages_c}{Wages_p} \right) + \beta_2 \Delta \ln \left(\frac{Productivity_c}{Productivity_p} \right) \tag{2}$$
$$+ \beta_3 \Delta \ln \left(Importsp - c \right) + \Delta \epsilon_{c,p}.$$

The first difference of the natural logarithm of bilateral exports of goods from country c to the partner country p ($p = 1, \ldots, 10$) is regressed against the first difference of the natural logarithm of the country's wages divided by the wages of the partner country, the first difference of the natural logarithm of the country's labor productivity relative to labor productivity in the partner country, and the first difference of the natural logarithm of total imports of the partner country excluding imports from the exporting country c. We expect a statistically significant $\beta_1 < 0$ if a country's bilateral exports are sensitive to wage differences. Put differently, in case of wage sensitivity, an increase in wages is associated with a decrease in exports.

A few aspects of this specification are worth pointing out. First, by entering both nominal wages and labor productivity in the specification, we are implicitly controlling for nominal unit labor costs. Second, we use imports and not the real GDP as a measure of demand for exports (the European Central Bank, for example, applies a similar measuring approach, see Hubrich & Karlsson, 2010). We do so because there is a high correlation between real GDP in the partner country and our measure of relative wage dynamics, which makes it difficult to disentangle the respective effects of the two variables. This modeling choice implies that the

Table 3. Wage sensitivity of exports, 1999–2014.

	Austria		France	Germany	Ireland	Netherlands	Portugal	Spain
$\Delta \ln \left(\frac{Wages_c}{Wages_p} \right)$	−.947		−1.081	.537	−.838*	.864*	−.083	−.247	−.549
	(.878)		(.964)	(.281)	(.359)	(.361)	(.541)	(.398)	(.296)
$\Delta \ln \left(\frac{Productivity_c}{Productivity_p} \right)$	.396		.558	−.155	.870*	.888	.355	.965	−.579
	(1.321)		(1.331)	(.310)	(.396)	(.760)	(.760)	(.630)	(.463)
$\Delta \ln (Imports_{p-c})$	.955*		.991*	.713*	.633*	−.006	.734*	.552*	.473*
	(.155)		(.171)	(.053)	(.076)	(.218)	(.175)	(.100)	(.129)
Constant	−.001		−.001	−.012	.003	.017	.026	.013	.013
	(.012)		(.013)	(.004)	(.007)	(.016)	(.014)	(.008)	(.009)
Observations	150		150	150	150	150	150	150	150
H_0: no autocorrelation	.000*	AR(1)	.831	.726	.106	.543	.600	.478
H_0: no cointegration	.102	.102	.157	.210	.155	.108	.146	.219
R^2	.407	.457	.594	.594	.021	.304	.230	.332

*$p <.05$.

estimated coefficients will not be fully comparable to those estimates of foreign demand in the literature which are based on the real GDP (for an overview of German export models, see Neumann, 2020).[8] Third, different from the determinants of wages, in this estimating equation we assume a simultaneous effect of relative wages on export outcomes. This is consistent with the lag structure of the Carlin and Soskice (2014) macro model, in which firms respond to a change in wages in the same period.

The analysis is based on annual observations of our set of 11 euro countries between 1999 and 2014. Data for bilateral exports and imports come from the OECD STAN Database on Bilateral Trade in Goods by Industry and End-use (ISIC Rev. 4). The exports figures are originally reported as thousand dollars. We have divided them by the dollar-euro exchange rate (from the Ameco database) and expressed them as trillion euros. Exports have then been expressed in 1999 constant prices by using export deflators (from the Ameco database). As in the previous analysis, the data on nominal wages and labor productivity are from the OECD Dataset on Productivity and Unit Labour Cost by Industry (ISIC Rev. 4). The models are again estimated by ordinary least squares with panel corrected standard errors, and test for stationarity and cointegration. Moreover, the data are weighted by taking into account that bilateral exports are of different magnitudes depending on the partner. Weights are constructed by dividing trade flows by the sample mean trade flow, such that bilateral exports above (below) the mean are weighted more (less).

Table 3 presents the results of our bilateral export models. In the case of Austria, France, Netherlands, Portugal, and Spain, changes in relative nominal wages do not have any detectable effect on bilateral exports.[9] The same holds true for relative labor productivity in these countries. At the same time, total imports in partner countries seems to be a significant predictor of export performance. The relationship is particularly strong in Austria, where a one percent increase in partner total imports leads to an almost equal percentage increase in bilateral exports. Since the Wooldridge test for autocorrelation suggests that there is serial correlation in the Austrian model, we estimate a second model for the country where we include a panel-specific Prais-Winsten autoregressive (AR1) transformation. The results remain substantially unchanged. A peculiar exception to these findings is Ireland. While labor productivity and imports seem to have no discernible effect on bilateral Irish exports, the estimation suggests that changes in relative wages are

positively associated with export growth. However, the coefficient of determination ($R^2 = .021$) indicates that the model does a very poor job of predicting the data. Thus, these results seem to add to a growing body of literature arguing that the strong presence of multinational corporations and foreign direct investment has a massively distorting impact on the Irish export economy (e.g. Brazys & Regan, 2017; Regan & Brazys, 2018).

The picture looks quite different in Germany. Here, changes in relative nominal wages exhibit a very strong negative relationship with changes in bilateral export performance. A one percent growth in relative nominal wages is associated with a 0.8 percentage point decrease in bilateral exports. Relative labor productivity is also a strong predictor in the German case. A one percent increase in productivity corresponds with a 0.9 percentage point growth in bilateral exports. Hence, unit labor costs are an important explanatory factor of German exports. Although changes in partner imports are statistically significantly related to changes in German exports, the size of this effect suggests that imports from euro countries are of less importance in Germany than in Austria and the Netherlands. In other words, compared with their Austrian and Dutch counterparts, German exports are more sensitive to wage changes and less sensitive to (euro) import changes. When we estimate models that use overall ULCs instead of wages and labor productivity, we find these results corroborated (see Table A7). Moreover, a quarterly analysis of Austrian, Dutch, and German bilateral export flows confirms that only German relative wages are negatively associated with exports (both in the shorter and the longer period, see Table A8).[10]

Our results show that relative nominal wage moderation is a significant predictor of German exports even controlling for productivity. Furthermore, they suggest that Germany is sui generis when compared with other Eurozone countries. It is the only country that seems to operate in accordance with the logic of the labor market view, i.e. wage coordination is associated with wage moderation and wage moderation in turn stimulates exports. To check how these results compare with the extant literature, Table A5 in the appendix reviews estimates of the price-elasticity of German exports from 20 empirical studies between 1998 and 2020. Most studies find a significant negative relationship between the German real exchange rate and German exports, but there is a lot of variation in estimated coefficients (elasticities vary from less than −1 to insignificantly different from zero). In general, estimates based on relative unit labor costs tend to be closer to zero than estimates based on relative prices. The results are a bit more mixed for German exports to the Eurozone, with models that focus on longer time periods showing a negative effect, which seems to disappear in shorter time series of more recent years. Furthermore, a few studies find small or insignificant elasticities. It should be noted that our estimates above are not strictly comparable to the extant literature, because our specification focuses on bilateral export flows to 10 Eurozone countries as opposed to total export flows. Moreover, our analysis is to our knowledge the only one to focus on relative bilateral nominal wages, controlling separately for relative bilateral productivity.

How can we explain the cross-country differences between Germany and other coordinated countries such as Austria and the Netherlands? Tables A12–A14 in the appendix try to shed some light on this question by re-estimating our bilateral export models across different categories of research and development (R&D)

intensity (for definitions of these categories, see Galindo-Rueda & Verger, 2016). In the Dutch case, exports of any degree of R&D intensity do not seem to depend on wages, confirming our previous finding in Table 3. The Austrian models show that only exports of medium-low R&D intensity (e.g. textiles, food products, furniture) are sensitive to changes in nominal wages. A one percent increase in nominal wages is estimated to lead to a 0.9 percentage point decrease in exports of this category. These exports account for about 27 percent (average across trading partners and time) of total Austrian exports. As for Germany, we find that German exports of medium (e.g. rubber and plastic products, basic metals) and medium-low R&D intensity exhibit a very strong degree of wage-sensitivity. The estimation suggests that a one-percent wage increase is associated with a 2.2 percentage point decrease in this type of exports, which accounts on average for roughly 29 percent (up to 40 percent in trade with Austria) of total German exports. Thus, the difference between Austria and Germany is that German medium and medium-low intensive products are far more sensitive to changes in nominal wages than similar exports in Austria. This result also suggests that relative wage differences mostly matter for German low-end sectors.

A case of German exceptionalism?

Overall, the empirical analysis reveals a striking pattern of German exceptionalism in the Eurozone. Wage moderation was largely a German phenomenon and had only there a significant impact on export growth. These findings dovetail with a growing body of research on the growing importance of wage moderation for the German growth model (Baccaro & Benassi, 2017; Kinderman, 2005; Scharpf, 2018; Streeck, 2009). In the following, we provide a brief summary of the emerging picture of Germany and how our paper adds to it.

After reunification, German manufacturing firms faced a cost problem, which reduced their ability to compete internationally. In particular, the need to finance the costs of unification had led to increased social security contributions and higher labor costs overall. The response to the cost problem was an employer offensive. In the 1990s, manufacturing firms (primarily but not exclusively those based in the new Lnder) began leaving employer associations to avoid being bound by the industry-level contract and associated wage provisions (Silvia & Schroeder, 2007; Turner, 1998). In response, employer associations introduced the option of membership without having to apply the industry contract. This move stemmed the hemorrhage but reduced the employers' capacity for coordination. Additional cost reductions were obtained by outsourcing non-essential functions to firms applying less expensive contracts (Doellgast & Greer, 2007; Helfen, 2011). In addition, large firms used their market power to squeeze the profit margins of domestic suppliers, creating further incentives for these firms to seek respite outside the scope of industry bargaining (Greer, 2008; Silvia & Schroeder, 2007).

Moreover, large firms restructured and internationalized their supply chains, offshoring and outsourcing especially (but not exclusively) the more labor intensive phases to former communist countries of Central and Eastern Europe (Geishecker, 2006; Kinkel & Lay, 2003). Often times the credible threat of relocating production suffced to extract concessions from workers in order to save existing jobs (Scharpf, 2018). Thus, the 1990s and afterwards saw a wave of concessionary bargaining at

the workplace level, exchanging 'opening clauses' for the promise of job security (Hassel & Rehder, 2001; Haipeter, 2009). The Hartz reforms of the early 2000s added momentum to cost cutting. However, the trend of wage moderation had begun before their introduction (Dustmann et al., 2014). Furthermore, as suggested by our descriptive analysis, wage moderation was not just a peculiarity of the service sector—the most affected by the Hartz reforms—but also (albeit to a lesser extent) of the manufacturing sector.

As a result, the German export industry increased dramatically as a share of GDP in the fifteen years preceding the crisis and so became the main driver of the economy as a whole. The findings of this study suggest that the euro contributed to cementing the export-led regime by giving Germany a lower nominal exchange rate than the deutsche mark would have had and by providing an opportunity for real exchange rate devaluation through nominal wage restraint, thus boosting exports. This reasoning is backed by two recent studies that look at the historic exchange-rate preferences of German economic actors. They show that the level of the exchange rate was already of major concern to German economic actors during the Bretton Woods years (Höpner, 2019), and that German exporters clearly understood that the exchange-rate implications of the common European currency would be beneficial for the competitiveness of their products (Tober, 2020).

Concluding discussion

The political economy research on the Eurocrisis has seen the emergence of two competing views. While proponents of the labor market view focus on wage bargaining institutions and wage trends, proponents of the finance-centric view emphasize the expansion of credit in peripheral countries and the increase in cross-border banking flows the euro brought about. In this paper, we have tried to assess the respective contributions of the two views.

First, we have estimated wage equations of the type that have appeared previously in the literature, modeling nominal wages as a function of institutional and economic variables but controlling for credit flows. Second, we have followed up with an analysis of export volumes in Germany, Austria, and the Netherlands, as well as in other countries, to ascertain to what extent relative wages were associated with export flows. These analyses lead us to conclude that the labor market view has exaggerated the role played by bargaining institutions in generating competitiveness losses in the periphery and competitiveness gains in the core. Differences in nominal wage growth cannot be attributed to uncoordinated vis–vis coordinated bargaining structures, but are better explained by differential patterns of domestic credit creation, which expanded in the periphery and contracted in Germany. Credit creation also generated catch-up growth in peripheral countries in the pre-crisis years (except in Italy) and led to increased imports in the south, thereby contributing to the building of current account imbalances.

At the same time, the labor market view captures some important elements of the German trajectory. The descriptive analysis detects an unusual degree of wage moderation in Germany. Moreover, we have found that nominal wages are a significant predictor of bilateral exports in Germany but not in any of the other countries examined. While German nominal wages decreased by 11 percent between 1999 and 2014 relative to the average trade partner, corresponding to a compound

growth rate of −0.8 percent per year (17 percent before the crisis, corresponding to a compound rate of −2.3 percent), labor productivity increased by only 2 percent relative to the average trade partner, corresponding to a compound annual growth rate of 0.1 percent (2 percent before the crisis, corresponding to a compound annual rate of 0.2 percent). In the same period, German exports to 10 Eurozone partners increased by a compound rate of 3.2 percent per year (7 percent before the crisis).

Based on the estimated elasticities presented in Table 3, we can calculate that wage moderation contributed to the growth rate of German exports by 0.65 percent per year, which amounts to 20 percent of the total growth rate of exports (1.9 percent before the crisis, i.e. 27 percent of the total growth rate). In contrast, labor productivity contributed 0.11 percent to the annual growth rate of German exports, corresponding to 3.6 percent of the total annual growth rate of exports (0.22 percent corresponding to 3.1 percent before the crisis).[11] This suggests that wage moderation contributed considerably more to Germany's export success than productivity growth.[12] The non-negligible effect of wage moderation—accounting for between one fifth and one quarter of German export growth—can be interpreted in two ways. First, a reduction of wages, controlling for productivity, increases profits and through this channel improves non-price competitiveness (e.g. by enabling more investments in marketing and distribution). Second, wage reduction leads to a decrease of relative prices, i.e. an improvement of price competitiveness. Both channels are compatible with our findings.

We believe that these results have important policy implications. While our analysis leads us to conclude that wage moderation matters for export performance in Germany, it does not imply that internal devaluation—i.e. wage cuts and and labor market liberalization—is the way to address imbalances in the Eurozone. On the contrary, especially for countries at the periphery, our findings suggest that collective bargaining institutions are not the main culprit of falling competitiveness. Therefore, deregulating them will only weaken aggregate demand even further. In contrast, policies aimed at increasing productivity in critical sectors are much more likely to promote a sustained economic recovery (see Italy as a case in point in Figure 2). More importantly, our analysis has shown that foreign demand is the pivotal factor for export performance in almost all euro countries. Thus, a coordinated demand stimulus combined with a strategy of reflation in Germany would likely help to redress imbalances and boost growth across the Eurozone.

Notes

1. This is a key assumption of both orthodox (New Keynesian) and heterodox models (see Carlin & Soskice, 2014; Storm & Naastepad, 2012).
2. The real interest rate is the difference between the nominal interest rate and the inflation rate, and is lower (higher) the higher (lower) the inflation rate. The RER is the ratio of domestic and foreign prices multiplied by the nominal exchange rate (quantity of foreign currency per unit of domestic currency) and appreciates (depreciates) when, keeping foreign prices constant, there is domestic inflation. An appreciation (depreciation) of the RERs implies that the country in question loses (gains) competitiveness with respect to trade partners.
3. It should be noted that while the real exchange rate disparity is a necessary consequence of countries having the same currency but different inflation rates, the real interest rate disparity is not. Rather, it is a contingent feature of the particular

way international financial markets have responded to the introduction of the euro in the first ten years of the new currency's life, and specifically of their treating sovereign bonds issued by core and peripheral countries as if they had essentially the same risk profile. This is demonstrated by the generalized decline of interest rates spreads relative to German bonds in the pre-crisis years. It was only after the start of the Eurocrisis that financial markets started differentiating—this time heavily—among bond-issuing countries (Schelkle, 2017; Sgherri & Zoli, 2009; Sinn, 2014).

4. In the explanation centered on domestic credit creation, cross-border flows emerge ex post from southern banks having to borrow reserves from northern banks (see Cesaratto, 2017).

5. These are Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands, Portugal, and Spain.

6. Outliers are those observations that lie outside 1.5 × the 'inter quartile range', i.e. the difference between the 75th and 25th quartiles.

7. One reason why we do not find a significant effect of wage coordination may be that our measure of wage coordination is less precise than the economic variables. Yet, we apply the same indicators used by the previous literature, which finds significant results (e.g. Johnston, 2012).

8. Our estimated coefficients underestimate (real) GDP-based estimates of the foreign demand elasticity of exports if imports outgrow the rate of GDP, i.e. if the elasticity of imports to GDP is more than 1. In our sample, imports grow considerably faster than GDP. The elasticity is approximately 1.8–1.9, depending on the country (estimates not shown). This implies that in order to derive an estimate of the total demand elasticity from our estimates, one needs to multiply the estimated country-level elasticity of imports by roughly 1.8–1.9. We thank an anonymous reviewer for pointing this out.

9. Nor do they in Belgium, Finland, Greece, and Italy (see Table A6).

10. We performed a number of additional computations to assess the robustness of this finding. When the analysis focuses on the sensitivity of exports to manufacturing wages (Table A9), it finds an insignificant coefficient even for Germany, while the effect of labor productivity remains significant (although smaller). This suggests that the cost advantage of German exports is not so much related to the direct containment of wage costs in the manufacturing sector, but to the indirect and systemic benefits of wage moderation for the German real exchange rate in the economy as a whole, including the non-exposed sectors (see Baccaro & Benassi, 2017). Moreover, Table A10 repeats the annual analysis for the pre-crisis period. We fail to reproduce the statistically significant effect of German relative wages in this specification. However, given the results of the quarterly analysis for the pre-crisis period (Table A8), we attribute this null finding to the large drop in the number of observations and the corresponding loss in statistical power. Finally, in Table A11, we add domestic credit as a predictor of trade flows. This variable is always insignificant suggesting that domestic credit has no direct impact on trade performance in any of these countries.

11. These calculations are obtained as follows: (estimated elasticity of the predictor from Table 3) × (compound annual rate of growth of the predictor)/(compound annual rate of growth of German exports).

12. The imports of Germany's EZ10 partners (excluding German exports) grew at an compound annual rate of 3.3 percent between 1999 and 2014 (6 percent before the crisis). By multiplying the foreign import elasticity of German exports (0.633), EZ10's imports contributed 64 percent of the total compound annual rate of German exports (54 percent of the total before the crisis). Thus, the imports of trade partners in the Eurozone were the most important determinant of German export growth.

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