

# New Theoretical Justifications for Industrial Policies<sup>\*</sup>

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## Abstract

The theoretical arguments in support of industrial policies are well known. But the recent global financial crisis, especially the Eurozone crisis and the considerable increase of inequality have forced us to rethink the role of productive structures. This inevitably leads us to a fundamental reconsideration of industrial policies. The paper makes two contributions to the literature: 1. We argue that countries with low technology productive structures experience comparatively more intense distributional conflict that leads to an explosion in unit labour costs. Thus, industrial policies are needed as a means to curb inflation and ameliorate distributional conflict. 2. Inflation targeting becomes destructive in monetary unions with divergent productive structures. Consequently, industrial policies are crucial to accelerate the convergence in productive structures as a means to reduce the asymmetric effects of union wide macro-policies.

**Keywords:** industrial policy, productive structure, distributional conflict, inflation targeting, Eurozone.

**JEL Classification:** D33, D40, E31, E58, L52, O52.

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# 1 Introduction

Much debate over the Eurozone crisis and its external imbalances have focused on the divergent labour costs across member states. At one extreme, there are scholars ([Flassbeck and Lapavistas \(2013\)](#), [Flassbeck and Lapavistas \(2016\)](#), [Priewe \(2011\)](#) and [Sinn \(2014\)](#), among others) who argue that external imbalances are driven purely by labour cost imbalances and at the other extreme, [Storm and Naastepad \(2015a\)](#), [Storm and Naastepad \(2015b\)](#), [Gabrisch and Staehr \(2014\)](#), [Diaz Sanchez and Varoudakis \(2013\)](#) and [Wyplosz \(2013\)](#) (among others) contend that asymmetric demand developments is the key driving factor. [Stockhammer and Sotiropoulos \(2014\)](#) take a balanced view and explain that both costs and demand factors matter.

The popular explanations for the divergence in labour costs are wage restraint ([Flassbeck and Lapavistas \(2013\)](#)), especially in Germany, rigid labour market institutions ([European Commission \(2011\)](#)) and uncoordinated wage bargaining institutions ([Stockhammer et al. \(2014\)](#), [Stockhammer and Onaran \(2012\)](#)). We contribute to this strand of the literature and posit that divergent productive structures are an important contributory factor. [Felipe and Kumar \(2011\)](#) show that aggregate measures of unit labour costs are simply the wage shares in national income — we build on this and show that countries with high technology productive structures (Eurozone core countries for instance) have firms with higher mark ups that lead to higher aggregate profit shares. It follows that higher technology productive structures have lower wage shares and by extension, lower unit labour costs. Thus, the higher unit labour costs observed in the periphery are connected to their low technology productive structures.

These low tech productive structures produce commodities in highly competitive markets, ergo, price flexibility is a key feature. Consequently, the gains from productivity growth are reaped in lower prices and in a cruel twist of fate, this engenders a tendency of falling wages. Labour, motivated by its own self-interest seeks to defend its wage share through wage bargaining institutions. Unit labour cost increases rapidly since wage demand always outpaces productivity growth, especially in consideration of the inverse wage-productivity relationship. The stronger labour market institutions and working class cohesion (([Stockhammer et al. \(2014\)](#))) we observe in the periphery can be understood as necessary outcomes from productive structures characterized by this inverse wage-productivity dynamic. Note, we do not ignore the role of politics in shaping different working class movements, however,

we do contend that economies with an inverse wage-productivity relationship will generate strong social forces to defend labour’s wage shares. This explains why distributional conflict is more intense in low technology productive structures.

Conversely, in high tech productive structures, the social forces that emerge to defend labour’s wage share become relatively less important, since productivity growth leads to higher wages. In these productive structures, price stability is a key feature, thus, productivity growth is shared between higher profits and wages. The positive wage-productivity relationship acts like an anchor on wage demand and produce comparatively less intense distributional conflicts. In a monetary union, member states with divergent productive structures are bound to experience divergent inflation rates or labour costs.

Given this analysis, industrial policies find new meaning — they can be used as a means to tame distributional conflicts. This is in contrast to much of the industrial policy literature ([Khan \(2015\)](#), [Chang \(2003\)](#), [Wade \(2012\)](#), [Lall et al. \(2006\)](#), [Botta \(2014\)](#) and [Reinert \(2008\)](#), among others), which focus on building industrial and technological capabilities to promote sustainable growth and structural transformation. But we also find an additional justification. In the context of the Eurozone, industrial policies can increase the efficiency of macroeconomic policies, in particular, inflation targeting. The latter becomes highly inefficient in a monetary union with divergent inflation rates. Industrial policies in the periphery can promote convergence in productive structures across the union, which makes inflation targeting and other union wide macro-policies less destructive. Unlike the conventional justifications of faster growth, technological progress and industrialization etc., industrial policies are also useful for macroeconomic management (in monetary unions) and managing conflicting claims over national income.

The remainder of the paper is organized as follows. [Section 2](#) outlines the theoretical framework and [section 3](#) presents our analytical results. In [section 4](#), we present an overview of preliminary evidence, [section 5](#) offers a brief discussion on the implications of our analysis for ongoing debates and [section 6](#) considers the consequences for inflation targeting. Finally, [section 7](#) concludes.

## 2 Productive Structures and Unit Labour Costs

### 2.1 Low Technology Productive Structures

We consider an economy that produces low technology commodities that usually fetch relatively low price and income elasticity of demand for exports and imports. Much of the global South ([Prebisch \(1950\)](#), [Singer \(1950\)](#)) and Eurozone periphery fit this description. The production matrix of these economies can be easily replicated with simply technology and limited production capabilities, thus, market competition is relatively intense both within and between economies. The dominant form of competition within the context of this production or technology matrix is *price* competition. Non-price competitive strategies are largely irrelevant due to the low value added content of the production matrix.

This justifies our first assumption — we assume that prices are largely flexible in low technology productive structures. Secondly, we assume that firms’ pricing policy is based on a mark up over variable costs and we assume that this mark up is constant, which reflects firms’ degree of monopoly ([Kalecki \(1954\)](#)).

$$p = (1 + \bar{\tau}) \frac{w}{\theta} \quad (1)$$

Equation (1) shows that prices  $p$  are a positive function of the mark up  $\tau$  and wages  $w$ , but inversely related to labour productivity  $\theta$ . Since we assume that prices are flexible, productivity growth leads to falling prices and this inevitably pull wages downwards, *ceteris paribus*. Thus, we model the wage-productivity relationship (hence forth  $w - \theta$ ) as follows, where  $\omega$  is real wage and  $\gamma$  is the productivity elasticity of wages. The first thing to note is that  $\omega$  is inversely related to the  $\tau$  and contrary to popular belief, there is an inverse relationship between labour productivity and wages — though this is only unique in low technology production structures. But the determination of  $\omega$  is not purely economic, so we include  $z^w$  to capture the bargaining power of workers, which in turn is determined by labour market institutions (*LMI*) ([Kristal \(2010\)](#)).

$$\omega = \frac{\theta^{-\gamma}}{(1 + \bar{\tau})} + z^w \quad (2)$$

We argue that the *tendency* of falling wages with productivity growth creates disincentive effects for further productivity growth. Given that  $\partial\omega/\partial\theta < 0$ , labour reacts through bargaining institutions to defend their wage share. Thus, we expect higher unionization

rates and more pro-labour policy in lower technology productive structures (Southern Eurozone countries for instance). [Stockhammer et al. \(2014\)](#) provide supporting evidence, which shows that social expenditures and protection as a ratio of GDP are higher in Southern Europe as compared to centre countries. While union density declined in both centre and peripheral countries, [Stockhammer et al. \(2014\)](#) demonstrated that this decline was relatively less intense in the periphery. We take the point that class restructuring forms an integral part in the economic process that resulted in European imbalances and the Euro crisis ([Stockhammer et al. \(2014\)](#)).

Our argument that labour reacts to the tendency of falling wages is similar in spirit to the well established theories of conflict inflation ([Rowthorn \(1977\)](#), [Rosenberg and Weisskopf \(1981\)](#), [Dutt \(1992\)](#), [Perry and Cline \(2013\)](#), [Lavoie \(1992\)](#)) — if the income claims of labour and capital exceed national income, the income claims are inconsistent and inflation will result such as to reconcile income claims nominally ([Stockhammer \(2008\)](#)). Our contribution is to demonstrate that distributional conflict, which can be inflationary, has deep origins in the productive structures of economies.

Equation (2) can also be rewritten in terms of real unit labour cost ( $rULC$ ). Equation (3) states that  $rULC$  is inversely related to  $\tau$  but directly related to the bargaining power of workers. Thus far, we have said little about the determination of  $\tau$ ? The primary factors are government policy, firm and worker bargaining power, degree of foreign competition, financialization and industrial concentration, which is related to the technological content of productive structures. Countries that produce and export commodities with relatively low technology content face fierce domestic and foreign competition — this places firms into market structures with low industrial concentration. This in turn reduces the size of  $\tau$ . It follows that countries with low technology productive structures have firms with low  $\tau$  and consequently, in aggregate, these countries have high  $rULC$ , *ceteris paribus*.

$$\omega/\theta^{-\gamma} = rULC = \frac{1}{(1 + \bar{\tau})} + z^w \quad (3)$$

Equation (3) can be interpreted differently, specifically, in purely distributional terms. Lower  $\tau$  lead to lower profit shares and by definition, higher wage shares. [Felipe and Kumar \(2011\)](#) contend that changes in  $rULC$  are the outcome of either changes in the price deflator or income distribution or both, since  $rULC$  is defined as total wage compensation per unit of output, adjusted for inflation. We build on this analysis and illustrate that technolog-

ical structures have distributional consequences. We take the point that the emphasis on  $rULC$  as a measure of competitiveness is misplaced (Felipe and Kumar (2011), Storm and Naastepad (2015a), Storm and Naastepad (2015b)), it is simply an outcome variable driven by distributional changes and we argue that productive structures are an important source of distributional dynamics.

## 2.2 High Technology Productive Structures

We also assume that  $\tau$  are fixed in high technology productive structures and since these economies have highly concentrated industrial structures — they face less intense foreign competition. It follows that they have higher  $\tau$  in comparison to the firms in countries with lower technology productive structures. *Non-price* competition becomes the dominant form of competition (ECB (2005), Felipe and Kumar (2011), Storm and Naastepad (2015a), Storm and Naastepad (2015b), Mazzucato and Perez (2014)), ergo, we assume that prices are fixed in the short run — unlike the case in low technology productive structures.

$$\bar{p} = (1 + \bar{\tau}) \frac{w}{\theta} \quad (4)$$

The key insight from (4) is that productivity growth does not lead to lower prices in the short run, rather, it leads to higher wages. Since wages rise with productivity growth ( $\partial\omega/\partial\theta > 0$ ), distributional conflicts are less intense as compared to the cases in low technology structures. Consequently, we expect lower unionization rates and less pro-labour policies and this is confirmed in Stockhammer et al. (2014) — this is in stark contrast to the case we discussed in section 2.1. Higher  $\tau$  in these productive structures, lead to lower  $rULC$ , *ceteris paribus*.

$$\omega = \frac{\theta^\lambda}{(1 + \bar{\tau})} + z^w \quad (5)$$

$$\omega/\theta^\lambda = rULC = \frac{1}{(1 + \bar{\tau})} + z^w \quad (6)$$

Two points are important to note here. The divergence in the *levels* of wage shares or unit labour costs can be explained by the different  $\tau$  across the Eurozone. The differences in the *rate of change* in wage shares or unit labour costs are due to the asymmetric labour reaction. In other words,  $rULC$  increases rapidly in the periphery because the inverse  $w - \theta$

relationship engenders intense social conflict. On the contrary, social reaction to declining wage shares are relatively less intense in centre countries on account of the positive  $w - \theta$  relationship.

## 2.3 Financialization

The creation of the common currency made it relatively easier for trade surplus countries to recycle their reserves in the form of credit to trade deficit countries. Also, the monetary union reduced exchange rate risks and enhanced the credit rating of peripheral countries — leading to capital inflows that far exceeded trade flows. This is important because capital flows affect productive structures and by extension, unit labour costs.

Consider the case of a country with a low technology productive structure and equations (7) and (8) illustrate the determinants of unemployment  $u_n$  and  $z^w$ . As capital flows into the country, aggregate income  $Y$  increases and reduces  $u_n$ . Consequently, the bargaining power of workers increase and so does wage demand — this in turn leads to higher wages, *ceteris paribus*. Base on (1), prices also rise. This is one channel through which financialization (broadly conceived), can affect wage growth and by extension,  $rULC$ . But there is more to this financialization story.

$$u_n = \pm\alpha_1 LMI - \alpha_2 Y \quad (7)$$

$$z^w = \pm\alpha_3 LMI - \alpha_4 u_n \quad (8)$$

Hein (2015), Stockhammer (2012), Hein and Detzer (2014) and others argue that financialization increases profit shares, particularly top income shares (Piketty and Saez (2007), Piketty and Saez (2003)) and Stockhammer (2013) empirically demonstrates that it reduces wage shares. Also, Stockhammer (2004) and the wider financialization literature show that it reduces capital accumulation. Thus, financialization generates profits without producing (Lapavistas (2013)) — importantly, this occurs across *all* countries, albeit, to varying degrees. But if financialization increases profit shares, it necessarily means that  $\tau$  is rising.

Generally speaking, the advent of financialization accompanies a weakened labour class through: 1. labour market de-regulation, 2. greater exit options for firms (Choi (2001)), 3. the rise of shareholder value philosophy, which promotes downsizing and the redistribution of firm assets (Lazonick and O’Sullivan (2000)), and 4. the rise of household indebtedness

and the self-perception of households as financial managers ([Langley \(2007\)](#)), which serve to reduce working class consciousness. Together, these increase the  $\tau$ . [Hein \(2015\)](#) also noted that financialization increases the financial overhead costs for non-financial enterprises and this too increases firms'  $\tau$ .

It is self-evident that a weakened labour class leads to a lower  $z^w$ , wage growth and  $rULC$ . But there is more to this story. Capital inflows into the periphery or low technology productive structures necessarily seek economic activities with high returns — in this case, non-tradable economic activities. Since high technology capabilities are limited, capital flows and cheap credit find themselves fueling consumption binges through the growth of non-tradables.

Fundamentally, financialization promotes a certain form of structural change, where non-tradables grow at the expense of the tradable sector. In other words, financialization crowds out industry, even the low technology industrial sector, hence, the idea of profiting without producing. As productive structures deteriorate, the intensity of distributional conflicts increases since the inverse  $w - \theta$  relationship ( $\partial\omega/\partial\theta < 0$ ) worsens. Ultimately, labour reacts, further fueling wage-inflation — though we have just explained how financialization weakens the labour class, these effects are asymmetric across the Eurozone. Specifically, [Stockhammer et al. \(2014\)](#) used wage dispersion as a proxy measure for working class cohesion and empirically demonstrated that wage dispersion had increased for Northern Eurozone countries as compared to the periphery.

The productive structures of the Eurozone core also deteriorated — [Stockhammer et al. \(2014\)](#) showed that manufacturing as a share of GDP declined by (5.2%) in the periphery and (0.8%) in Northern Eurozone countries from 2000-2008. But core countries still remained on a higher technological frontier as compared to the periphery, hence, the observed divergence in  $rULC$ . [Table 1](#) summarizes the key features between high and low technology productive structures — it illustrates that financialization worsens distributional conflict and accelerates the growth in  $rULC$  in peripheral countries due to its pre-existing inverse  $w - \theta$  relationship.

### 3 Results

Consider [Figure 1](#) where the  $w - \theta$  curve is U shaped to demonstrate our non-linear modeling of this relationship. The distributional conflict curve ( $DC$ ) is downward sloping to illustrate that the intensity of distributional conflicts deteriorates as countries move to higher tech-



**Table 1:** Key Features of Productive Structures with Financialization Effects

Centre Countries	Peripheral Countries
High technology productive structure	Low technology productive structure
Higher mark up	Lower mark up
Lower wage share & ULC	Higher wage share & ULC
(+) Wage-productivity relationship	(−) Wage-productivity relationship
Less intense distributional conflict	More intense distributional conflict
<b>Financialization</b>	
Increase in profit share and mark up	Increase in profit share and mark up
(+) Wage-productivity relationship acts like an anchor on wage growth and therefore, restrains the growth in ULC	Distributional conflict becomes entrenched and accelerates ULC

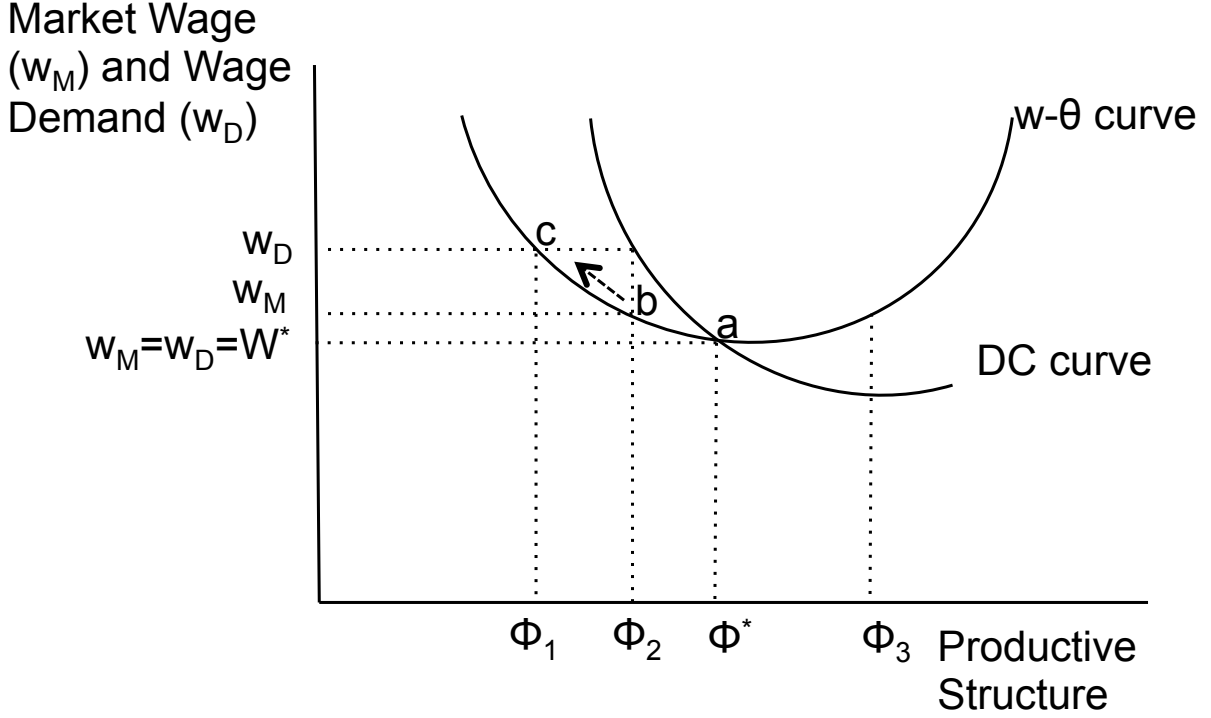
Source: Author's representation.

nological frontiers, where productivity growth leads to wage increases. Where the  $w - \theta$  and  $DC$  curves intersect depicts the point of equilibrium. At this equilibrium, distributional conflicts are absent — meaning that wage demand ( $w_D$ ) and market wages ( $w_M$ ) are equal. This is true at a given productive structure, say  $\Phi^*$ . The gap between the  $w - \theta$  and  $DC$  curves capture the difference between  $w_D$  and  $w_M$  and therefore, represent the intensity of distributional conflict. Are the equilibrium outcomes of  $\Phi^*$  and  $w^*$  stable?

Consider the disequilibrium outcomes associated with  $\Phi_2$ , where  $w_D > w_M$ . Through labour bargaining institutions, there are upward pressures on market wages to move from  $b$  to  $c$ , which coincides with a deterioration in the productive structure to  $\Phi_1$ . The latter in turn worsens the  $DC$ , further fueling  $w_D$  until  $rULC$  increases. As it relates to the stability condition, any point below  $\Phi^*$  produces unstable dynamics that lead to  $w_D > w_M$  or an escalation of  $rULC$ . Now consider disequilibrium outcomes above  $\Phi^*$ , say  $\Phi_3$ . At the latter,

$w_D < w_M$  and this has two consequential effects. Firstly, growth in  $rULC$  is anchored since the following holds ( $\partial\omega/\partial\theta > 0$ ). Secondly, the latter generates sufficient incentive to further increase productivity or the technological content of the productive structure — moving away from initial equilibrium  $\Phi^*$ .

**Figure 1:** Productive Structures, Distributional Conflict and  $ULC$



Fundamentally, equilibrium at  $a$  is unstable or the elimination of distributional conflict can only be achieved accidentally and temporarily. In the context of the Eurozone, periphery and centre countries are located below and above  $\Phi^*$  respectively. Our analysis demonstrates that the integration of asymmetric productive structures will always lead to divergence in  $rULC$ . Since market forces do not automatically reconcile conflicting claims or achieve equilibrium at point  $a$ , the sources of adjustment are exogenously determined. Fiscal austerity, internal devaluations and labour market de-regulations are being promoted by the Euro-institutions as a means to shift the  $DC$  curve downwards. The central objective of this strategy is to adjust the divergence in  $rULC$  between centre and periphery. But as our analysis shows, shifts in the relevant curves do not change the central dynamics. So as long as countries are on different technological frontiers (either above or below  $\Phi^*$ ), divergence in

$rULC$  is inevitable. What is needed is a technological transformation in the periphery to push their economies beyond  $\Phi^*$ .

The unstable process depicted in [Figure 1](#) suggests that  $rULC$  will rise indefinitely at productive structures below  $\Phi^*$ , while the reverse is true above  $\Phi^*$ . However, in the real world,  $rULC$  do not rise or decline indefinitely — there are stabilizing forces that impose upper and lower limits. Unfortunately, the stabilizing forces come in the form of crises — either a crisis of indebtedness related to the accumulation of current account deficits or a crisis of profitability associated with high wage shares, or a realization crisis associated with low wage shares or finally, a financial crisis.

Divergence in  $rULC$  has two effects — on the one hand, it accompanies external deficits and surpluses and on the other, it produces divergent economic performance across countries. Higher wage shares and relatively cheap credit in the periphery led to demand booms, shifted current account balances into deficits and supported rapid economic growth. Conversely, as the centre countries accumulated external surpluses, they grew more slowly due to lower wage shares and weak domestic demand. [Thirlwall \(1979\)](#) contends that the only mechanism to adjust current account imbalances is to start a program of economic divergence. Specifically, the periphery needs to reduce its income growth through fiscal austerity and internal devaluation, while centre countries require faster income growth and fiscal stimulus. Nothing short of a crisis is required for countries to voluntarily choose austerity programs and wage cuts. Deflationary policies such as these increase unemployment and based on (8), reduces workers' bargaining power,  $z^w$ . This sets the stage for the adjustment process, where  $rULC$  adjusts downwards for countries in the periphery. Higher income growth and lower unemployment in centre countries increase  $z^w$  and therefore,  $rULC$  adjusts upwards.

Current account imbalances lead to debt accumulation, specifically household debt, as in the case of the Eurozone periphery. But since the Eurozone crisis, private debt default and other dimensions of insolvency, governments had little choice but to assume these debts. As risk premia increased, governments were forced to reform to reduce their debt levels. A key component of many reforms, especially the IMF's reform packages — is labour market reforms. These go far beyond wage cuts and expand to extensive de-regulation of labour markets — de-unionization and deterioration of key welfare institutions. These particular changes in  $LMI$  reduce  $z^w$  — setting the stage for downward adjustments in  $rULC$ . Our principal point is that these draconian reforms are hardly ever implemented, save and except for moments of crises.

Now consider financial crises as an adjustment mechanism. Conspicuous consumption and cheap credit led to a housing bubble in the Eurozone periphery and this served as an important source for wealth based consumption. Since much of the latter were leaked out as imports, this was a key factor driving current account deficits. The housing bubble also created a construction boom that increased  $rULC$  on two fronts: 1. it reduced unemployment and increased  $z^w$  and 2. since much of the construction sector is labour intensive, the construction boom resulted in intense wage growth. However, this entire process is unsustainable — when the housing crisis emerged, wealth based consumption declined, imports adjusted and crucially, wage growth decelerated with the ultimate downward adjustment in  $rULC$ .

From the Marxist perspective ([Goodwin \(1972\)](#), [Goldstein \(1999\)](#), [Barbosa-Filho and Taylor \(2006\)](#)), intense wage growth and the corresponding rise in  $rULC$  creates a profit squeeze and engenders a crisis of profitability. This in turn reduces capital formation, economic growth and employment, which reduces  $z^w$  and  $rULC$ . However, [Stockhammer and Michell \(2014\)](#) show that what may appear as a Goodwin cycle might in fact be a pseudo Goodwin cycle. Instead of high wage shares or  $rULC$  igniting a profit squeeze and an economic downturn, the latter maybe caused by financial fragility. But irrespective of the source of the profit squeeze, the adjustment mechanism comes in the form of a crisis. These various mechanisms of adjustment must be understood only as a reset button. The central dynamics that lead to divergent  $rULC$  across different productive structures remain the same.

## 4 Preliminary Evidence

In this section we present preliminary evidence that show how productive structures differ across the Eurozone and demonstrate how these differences affect the Eurozone’s most popular macroeconomic indicator — unit labour costs. [Table 2](#) shows the valued added for high, medium and low technology manufacturing for selected Eurozone countries *relative* to Germany from 1999-2007. The divergence in productive structures is striking in the high and medium technology manufacturing sectors. Note, that this divergence is greatest between Germany and Greece for both high and medium technology manufacturing. In absolute terms, Germany’s value added share in high technology manufacturing actually increased with a marginal decline in medium and low technology manufacturing — this is consistent with its outsourcing strategy to Eastern Europe. Crucially, Greece, Italy and Portugal gained

in relative terms in low technology manufacturing.

We have already shown in [section 2.2](#) that stable prices are a feature of high technology productive structures, but in the context of exports, high technology products are destined for highly priced markets. [Table 3](#) shows the share of exports to high, medium and low price market segments for selected Eurozone countries and the Eurozone as a whole. Germany has the highest share of exports in high-price markets in 1999 and 2007 and also in 2007 for medium price markets. At the other extreme, Greece has the lowest share in high-price markets but the highest in low-price markets for both years.

**Table 2:** Value added share (relative to Germany) in percentage differences

	Manufacturing in:					
	High & medium-high technology		Medium-technology		Medium-low & low technology	
	1999	2007	1999	2007	1999	2007
France	-3.5	-9.6	-0.5	0.4	1.2	1.3
Greece	-12.9	-14.9	-8.6	-8.3	3.5	3.6
Italy	-4.0	-7.8	-2.2	-1.8	4.0	4.3
Portugal	-7.1	-11.2	-2.1	-0.7	5.9	6.7
Spain	-5.4	-11.4	-4.9	-3.4	2.4	0.9
<i>Memo:</i>						
Germany	24.9	27.3	21.4	21.0	19.9	19.0

Source: [Storm and Naastepad \(2015b\)](#)

[Botta \(2014\)](#) computes a productive structure similarity index (*PSSI*) for selected Eurozone countries relative to Germany to measure the degree of divergence in productive structures from 1999-2011. The *PSSI* ranges from 0 (identical productive structures) to 1 (absolute divergence in productive structures). See [Botta \(2014\)](#) for a discussion on how this index is computed. [Figure 2](#) depicts the relative divergence for the selected countries. The first thing to note is that since 1999 productive structures differed between the selected countries and Germany, crucially, this difference was greatest for Greece and Portugal. Secondly, over the time period, the divergence in productive structures widened, especially for Greece and Portugal. The dynamics of the *PSSI* support the evidence presented in [Table 2](#) and [Table 3](#).

If there are indeed substantial differences in productive structures at the macro level, we

**Table 3:** Export Structure 1999-2007

	Share (%) of exports in:					
	High-price segment		Medium-price		Low-price segment	
	1999	2007	1999	2007	1999	2007
France	37.8	34.9	43.1	41.7	19.1	23.4
Germany	43.1	40.2	43.9	45.0	13.0	14.8
Greece	15.6	18.5	41.0	31.6	43.4	49.9
Italy	27.5	24.9	45.5	41.3	27.1	33.8
Portugal	16.0	19.0	46.6	36.8	37.4	44.2
Spain	20.6	27.0	37.3	33.8	42.1	39.2
Eurozone	36.1	34.3	40.6	39.6	23.3	26.1

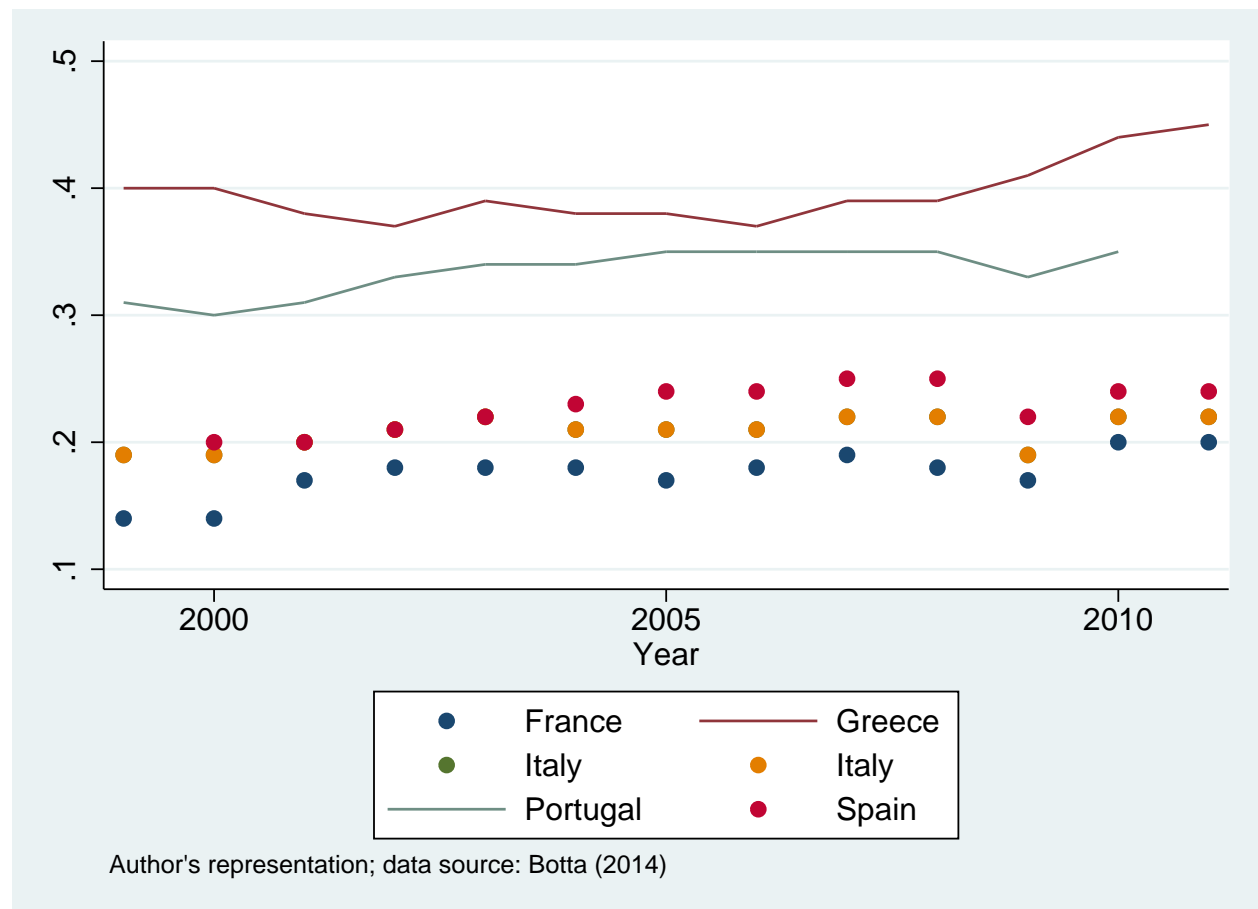
Source: [Storm and Naastepad \(2015b\)](#)

must expect supporting evidence at the micro level. We'd expect firms to have higher rates of innovation and technological progress in centre countries and high technology productive structures. [Figure 3](#) shows the number of patent applications to the European Patent Office (EPO) by Eurozone countries and it is clear that centre countries are the dominant patent applicants. Based on this indicator, Germany is the most technology intensive economy and this corroborates the evidence shown in [Table 2](#) and [Table 3](#). Though much of the literature argues that the key to Germany's success is its wage stagnation, a closer look at [Figure 3](#) indicates that this argument is too simplistic. Germany is clearly out-competing the rest of the Eurozone in patent application and also innovation, if this is an adequate forward indicator.

Corroborating evidence is presented in [Botta \(2014\)](#) — the author shows that peripheral economies (excluding Ireland) lag behind centre countries in terms of the accumulation of human resources as measured by the percentage of new doctoral graduates per thousand inhabitants (aged 24-64), and by the percentage of people completing upper secondary and tertiary education. Further, private and public financing of research activities and innovation, and firms involvement in R&D are disappointing in peripheral countries ([Botta \(2014\)](#)) — this supports our evidence regarding patent applications.

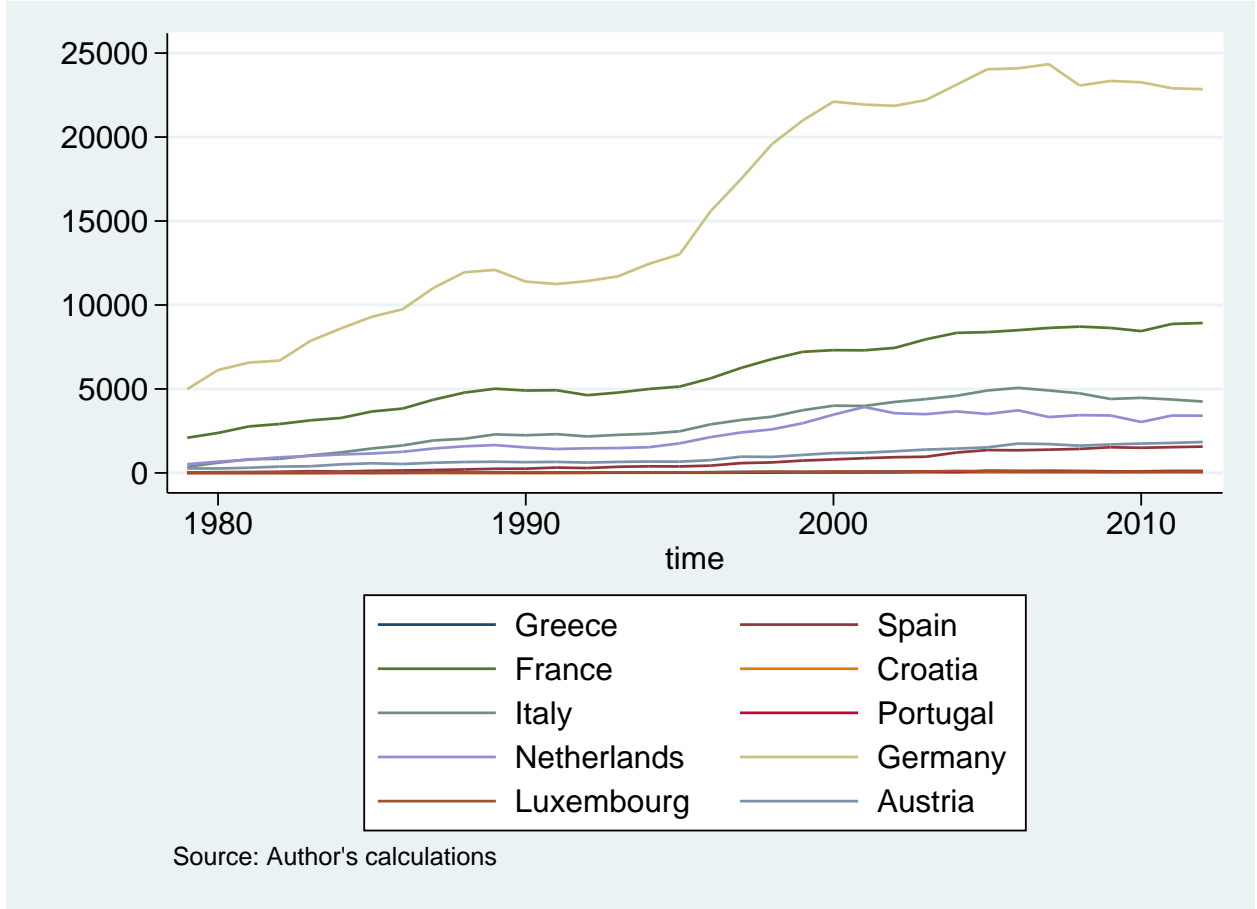
[Figure 4](#) illustrates an inverse and robust relationship between the average share of high

**Figure 2:** Productive Structure Similarity Index for selected Eurozone countries relative to Germany



technology ( $HT$ ) products in exports and nominal unit labour cost — this is consistent with our theoretical prediction. The share of  $HT$  products in exports is our proxy measure for productive structure. Based on our regression result, high technology exports explain 64% of the divergence in unit labour cost. But it must be noted that this estimation excludes Luxembourg, Greece, Portugal and Spain. When these are included, the relationship remains negative but becomes insignificant. The base year for the unit labour cost data series is 2005 unlike the widely used 1990 and this has resulted in extremely low unit labour cost for the excluded countries. Nonetheless, the majority of the data falls within the 95% confidence interval as is depicted by the shaded region in [Figure 4](#). Conclusive evidence requires the estimation of a fully specified model and the use of better data series for  $rULC$ .

**Figure 3:** Number of Patent Applications to the EPO



## 5 Discussion

Our analytical framework has a number of implications for ongoing debates. Much of the literature ([Flassbeck and Lapavistas \(2013\)](#), [Sinn \(2014\)](#), [Priewe \(2011\)](#), and others) argue that Germany's ability to squeeze its workers is the principal (in the extreme cases) or an important source (in the more measured view) ([Stockhammer and Sotiropoulos \(2014\)](#)) of its trade surpluses and relatively low  $rULC$ . But the implication of the positive  $w - \theta$  relationship in high technology structures should not be underestimated — it is an important abatement of distributional conflict. Further, what the literature observe as wage squeeze, stagnation or suppression might simply be the distributional dynamics of productive structures at work. Note, that we do not ignore the role of  $LMI$  in determining  $rULC$ , we simply argue that the different working class movements in various countries are closely related to



the technology content of their productive structures. We expect strong labour movements when wages and productivity are inversely related and the reverse is true.

Lapavitsas et al. (2010), Bofinger (2015) and others posit that Germany was a laggard in terms of productivity growth in the years leading up to the Eurozone crisis, thus, wage suppression was the only available means to improve competitiveness. More concretely, Lapavitsas et al. (2010) claim that:

Peripheral countries have generally improved productivity, and certainly done better than Germany, which has been a laggard. It cannot be overstressed that gains in German competitiveness have nothing to do with investment, technology, and efficiency.

But Storm (2016b) is adamant that Germany's wages and productivity were growing faster than peripheral countries — indicating that the wage moderation in Germany is a myth. Storm argues that labour productivity defined per person employed will indicate that Germany is a productivity laggard but this indicator is misleading. A better measure is per hour worked since the average German employee was working two hundred hours less per year than his/her average Eurozone colleague. Storm (2016b) explains that:

Any comparison of Eurozone wages or productivity per person employed is consequently misleading, as it understates (overstates) wages and productivity in the country where workers work fewer (more) hours (in comparative terms).

Our framework demonstrates that the  $w - \theta$  relationship is embedded within technological structures and this has the following implications. Firstly, one cannot compare productivity levels across countries with vastly different productive structures — countries that are on higher technological frontiers will experience lower  $rULC$ , a positive  $w - \theta$  relationship and external surpluses, irrespective of productivity growth or efficiency. Just as  $rULC$  is a useless proxy of competitiveness (Felipe and Kumar (2011)), aggregate measures of productivity are also limited — what matters is the level or growth of productivity in specific activities — whether high or low technology activities. As it relates to Lapavitsas et al. (2010) claim regarding technology and competitiveness in Germany, see Simonazzi et al. (2013), Janger et al. (2011), Storm and Naastepad (2015b), Storm and Naastepad (2015a) and section 5 for evidence to the contrary.

In their attempt to prove wage moderation in Germany, Flassbeck and Lapavitsas (2016) argue that productivity growth have different effects at the firm and macro-economy levels. In

the case of the former, they posit that prices are given and any increases in firm-productivity leads to lower unit labour costs and by extension, enhanced competitiveness. But in the case of the macro-economy, [Flassbeck and Lapavitsas \(2016\)](#) contend that productivity growth leads to higher wage growth — leaving real unit labour cost and competitiveness unchanged. Thus, any reduction in unit costs in Germany can only be the outcome of wage moderation.

We disagree with this view on two fronts. Firstly, we have shown that the  $w - \theta$  dynamics at the macro-level depend on the economy’s productive structure and it is not a given that higher productivity leads to higher wages. Secondly, we side with [Storm \(2016a\)](#), who explains that [Flassbeck and Lapavitsas \(2016\)](#) ignore the importance of oligopolistic competition — their argument about productivity at the firm level implies that firms do not have price-setting power, share the same production technologies, and produce more or less similar (homogenous) goods ([Storm \(2016a\)](#)). In fact, our framework is based on oligopolistic competition in high technology productive structures — it is this that explains their higher  $\tau$  as compared to more competitive industries in low technology productive structures.

An interesting strand of this wider debate regards causation — did external imbalances lead to divergence in unit labour costs or is the causal mechanism reversed. [Lapavitsas et al. \(2010\)](#), [Bofinger \(2015\)](#) and others side on the latter causal chain while [Storm and Naastepad \(2015a\)](#), [Storm and Naastepad \(2015b\)](#), [Gabrisch and Staehr \(2014\)](#), [Gaulier and Vicard \(2012\)](#) and others side with the former. We also argue that divergence in  $rULC$  is a consequence rather than a cause, but for a different reason from [Storm and Naastepad \(2015a\)](#) and [Storm and Naastepad \(2015b\)](#). They contend that the *EMU* reduced exchange rate risks and encouraged capital flows to the periphery, which in turn fueled a housing bubble and wage growth. We do not disagree that such a process occurred, however, as [Figure 2](#) shows, productive structures differed from the get-go, therefore, the conditions for divergence were present long before the *EMU*.

Both [Stockhammer et al. \(2014\)](#) and [Lapavitsas et al. \(2010\)](#) (among others) contend that Germany’s outsourcing to Eastern Europe played an important role in reducing its wage share and thereby, improving its external competitiveness. But [Stockhammer et al. \(2014\)](#) provided evidence that showed an absolute decline of in industry by (-1.8%) in Eastern Europe for the period 2000-2008. This means that Germany outsourced activities with low technology content, the cumulative effect is that its industrial structure has become more concentrated and technology intensive — see [section 4](#) for supporting evidence. Based on our theoretical framework, we’d expect higher  $\tau$  and a correspondingly lower wage share and

$rULC$ .

## 6 Inflation Targeting

The (preliminary) empirical evidence and theoretical framework presented support the view that the divergent inflationary dynamics across the Eurozone are driven by differences in productive structures. It follows that inflation targeting at the *EMU* level puts policymakers in an unenviable position. At one extreme, centre countries have low and sometimes deflationary tendencies due to higher  $\tau$  and at the other, peripheral countries experience inflationary booms due to their low technology productive structures. This is a major macroeconomic concern since a monetary union is a commitment to a common inflation rate ([Bibow \(2012\)](#)). We argue that a monetary union composed of countries with divergent productive structures have less efficient union-wide macro-policies.

In the context of inflation targeting, if monetary authorities try to curb high inflation in countries with low technology productive structures, the increase of interest rates can potentially create deflationary threats in the low inflation countries — note that the reverse is also true. In fact, many scholars including [Storm and Naastepad \(2015b\)](#) argue that the ECB’s easy monetary policy in the years preceding the Eurozone crisis, which aimed at jump starting a German recovery, exacerbated the inflationary boom in peripheral countries.

When we invoke the Ricardian Equivalence ([Barro \(1974\)](#)) and the Lucas Critique ([Lucas \(1976\)](#)), monetary policy becomes the corner stone of the New Consensus Macroeconomics. This means meeting the lone objective of certain inflation targets and using interest rate policy when needed to ensure that the rate of economic growth or capacity utilization remains on trend ([Angeriz and Arestis \(2008\)](#)). But [Stiglitz \(2011\)](#) argues that inflation targeting is only useful when the source of inflation is demand pull, if it is cost push inflation, higher interest rates will ignite an economic downturn with only marginal effects on the rate of inflation. Further, [Stiglitz \(2011\)](#), [Angeriz and Arestis \(2008\)](#) and others claim that there are good reasons to question the Ricardian Equivalence and Lucas critique. Fundamentally, monetary policy must expand beyond inflation targeting to inequality, unemployment etc. We contribute to this critique with the contention that inflation targeting becomes destructive in monetary unions with divergent productive structures, as we explained above.

However, [Dullien and Fritsche \(2009\)](#) posit that divergences in inflation do not necessarily mean trouble for a monetary union, especially if divergence is due to exogenous shocks or

temporary disequilibria. For instance, if countries have entered the monetary union at an over or undervalued exchange rate, below or above average inflation rates over a number of years might be required just to bring a region’s real exchange rate to an equilibrium. Alternatively, divergences can just be a sign of a different position in the business cycle. These points are taken. But as [section 2](#) and [section 4](#) demonstrate, there are important structural sources of the divergent inflationary process across the Eurozone.

According to Optimal Currency Area theory, common wage bargaining or wage coordination is critical in preventing asymmetric shocks and sustaining a monetary union. [Stockhammer and Onaran \(2012\)](#) argue for the following specifics — wage growth in excess of productivity growth for centre countries, strengthening of LMI in the core, a higher inflation target and wage increases in line with the inflation target. They argue that this is a pro-growth, pro-employment rebalancing strategy as compared to fiscal austerity and internal devaluation. We do not take issue with these ideas, especially since the Eurozone as a whole is considered to be wage-led ([Onaran and Galanis \(2014\)](#), [Stockhammer and Onaran \(2012\)](#)). However, we interpret the proposed wage policy as a growth strategy and are less convinced that it will adequately rebalance the diverging inflation rates. To be clear, [Stockhammer and Onaran \(2012\)](#) carefully explained that German inflation would have to exceed inflation in the periphery by almost 3% points a year for an entire decade just to revert to the relative unit labour cost positions of 2000.

But in our estimation, this prediction is questionable since it does not account for the dynamics around the inverse  $w - \theta$  relationship in the periphery. We have shown how the tendency of falling wages is an important push factor for growth in  $rULC$  and inflation. In plain terms, a coordinated wage strategy does little to address the  $w - \theta$  dynamics in high and low technology productive structures, which leads to diverging inflation rates. A growth and rebalancing strategy should include the proposals outlined in [Stockhammer and Onaran \(2012\)](#) but also industrial policies for peripheral countries to make their  $w - \theta$  dynamics less inflationary. In our view, industrial policy becomes an important rebalancing strategy and makes inflation targeting less destructive. It is important to note that in recent work, [Constantine et al. \(2016\)](#) argue that peripheral countries require productive investment and industrial strategies but this was within the context of eliminating structural trade imbalances.

## 7 Conclusion

We argue that the divergent inflation rates or unit labour costs observed across the Eurozone are closely related to the divergent productive structures of member countries. Germany's wage restraint and rigid labour market institutions in the periphery are the popular explanations but in this article, we show that the higher technology content of centre countries' productive structures are associated with higher mark ups and profit shares — this inevitably leads to comparatively lower wage shares and unit labour costs.

Unlike the low technology productive structures in the periphery, productivity growth leads to higher wage growth in centre countries and this positive wage-productivity relationship acts like an anchor on wage growth. Conversely, productive structures in the periphery produce commodities that are destined for highly competitive markets, crucially, productivity growth leads to lower prices and wages. Thus, in low technology productive structures, productivity growth creates a tendency of falling wages and this in turn ignites a social reaction of higher wage demand. Unlike the Eurozone core, distributional conflict in the periphery is more intense — the cumulative effect is an escalation of relative unit labour cost. When financialization is added to this story, it accelerates structural divergence and consequently, exacerbates the divergent inflationary outcomes.

Post-Keynesians have long argued in favour of income policies as a means to reduce distributional conflict, our analysis demonstrates that convergence in productive structures for countries in a monetary union can play a similar role. Therefore, the paper proposes a new theoretical justification for industrial policies. Given diverging inflation rates, it follows that inflation targeting becomes disastrous. Monetary authorities might choose to curb runaway inflation but run the risk of deflation in low inflation countries, alternatively, they might choose to boost inflation in the latter and run the risk of aggravating inflation elsewhere. Thus, industrial policies that promote convergence in productive structures can enhance the efficiency of macroeconomic policies in monetary unions.

The ongoing debates about price and cost competitiveness on one hand and non-price competitiveness on the other discuss these as separate concepts. But our framework illustrates that price/cost competitiveness increases as an economy builds its non-price competitiveness capabilities. Price and non-price competition are not disconnected but integrally related — more research is needed to better understand this relationship.

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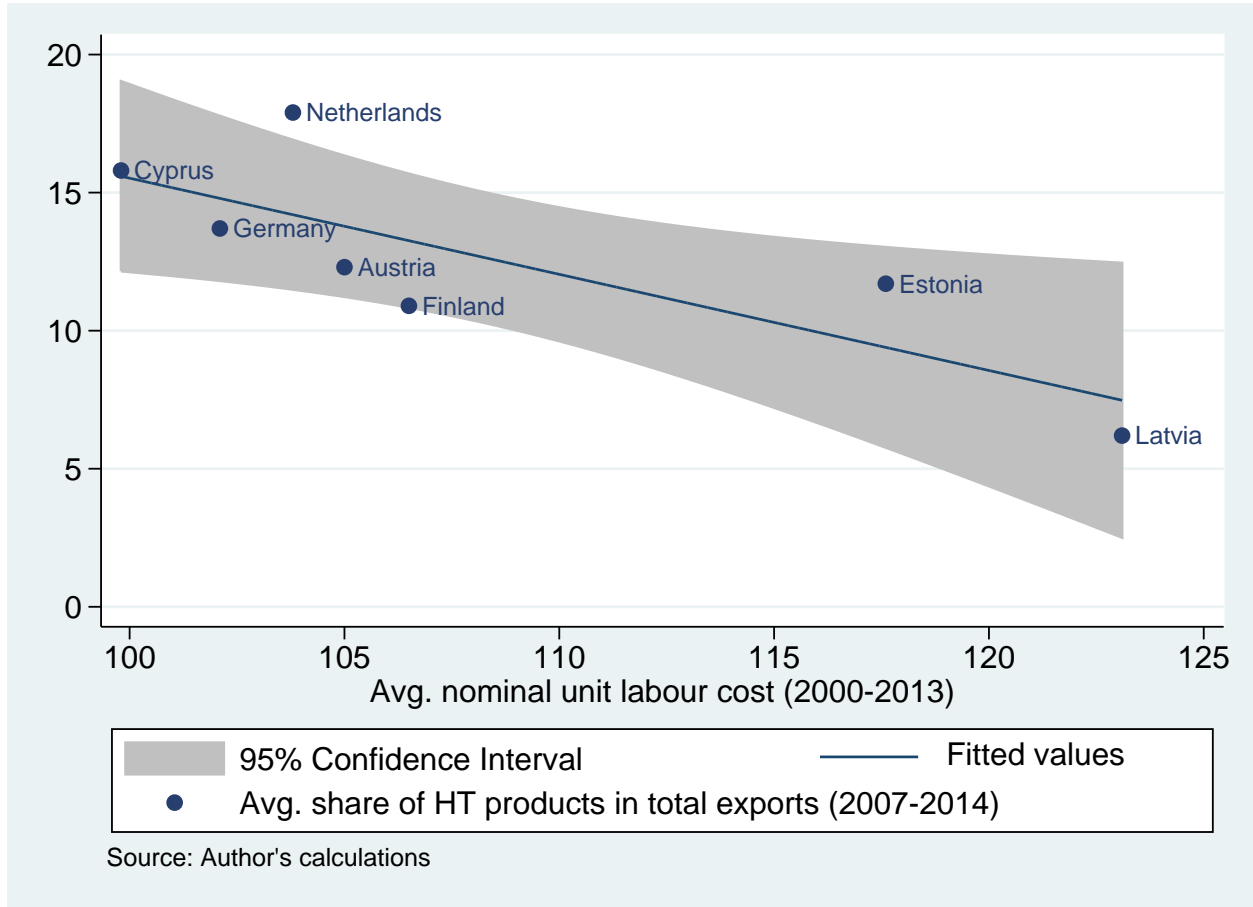


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**Figure 4:** Productive Structure and Unit Labour Cost



*Notes:* The data source is Eurostat and the OLS regression results are as follows:  $ULC_i = 131.8 - 1.86^* \text{ average share of HT products in total exports}$  with standard errors (0.6) and (-3.64) respectively.  $R^2 = 0.64$ ;  $F = 13.22^*$ ; No. of observations = 8. \*\*\*, \*\*, \* indicate statistical significance at the 10%, 5% and 1% level respectively. These results do not change in any meaningful way when we employ a tighter dataset.