Wages, income distribution and economic growth in Scandinavia

Bengtsson, Erik; Stockhammer, Engelbert

2018

Document Version:
Other version

Lund Papers in Economic History

No. 179, 2018 *General Issues*

Wages, income distribution and economic growth in Scandinavia

Erik Bengtsson & Engelbert Stockhammer

DEPARTMENT OF ECONOMIC HISTORY, LUND UNIVERSITY

Lund Papers in Economic History
ISRN LUSADG-SAEH-P--18/179--SE+29

Orders of printed single back issues (no. 1-65)
Department of Economic History, Lund University
Postal address: P.O. Box 7083, S-220 07 Lund, Sweden
Telephone: +46 46 2227475
Telefax: +46 46 131585

Full-text electronic issues (no. 58, 60, 61, 66--)
www.ekh.lu.se

Lund Papers in Economic History are published by the Department of Economic History, Lund University, Sweden. This series replaces the former series under the title *Meddelande från ekonomisk-historiska institutionen, Lunds universitet*. The change of name reflects the orientation of the series towards an international readership. The series is multilingual, but the majority of the working papers appear in English.

Lund Papers in Economic History include papers in the following topic areas:

General Issues
Development Economics
Education and the Labour Market
Population Economics

Lund Papers in Economic History are published as occasion arises, not at fixed intervals. Printed issues are distributed to libraries. From 1999 and onwards, full-text electronic issues are also available on *www.ekh.lu.se*. Those who would be interested in receiving information by email on new issues of **Lund Papers in Economic History** are requested to send an email message to *Lund.Papers@ekh.lu.se*.

LUND
UNIVERSITY

Wages, income distribution and economic growth in Scandinavia*

Erik Bengtsson♣ and Engelbert Stockhammer♠

Abstract

Wage restraint plays an important role in the conventional economic history explanation of the post-war golden growth experience of industrialized economies. Conversely, wage increases harming investment and increasing unemployment have been proffered as explanations for some of the high unemployment during the interwar period. This article argues that the conventional account implicitly only considers effects of wage growth on investment and not the advantageous effects on consumption. Thus, the evaluation of the effects on GDP growth is lop-sided. We employ a Post-Keynesian model to estimate effects of growth in the wage share of national income on consumption, investment, exports and imports separately, and weigh the effects together to estimate total effects on GDP growth, in Scandinavia (Denmark, Norway and Sweden) 1900–2010. Furthermore, we estimate the positive effects of wage pressure on productivity, showing it to be significant and positive in all three countries. We show that the postwar wage push had small positive effects on GDP growth in Denmark and Sweden, and a small negative effect in Norway. Thus, wage restraint is not a valid explanation for the postwar growth miracle. We propose a more comprehensive macroeconomic framework for understanding the implications of labour-capital distribution.

Keywords: functional income distribution, inequality, consumption, investment, Scandinavia, Bhaduri-Marglin model, economic history

JEL codes: E12. N1, N14

* This paper is written as part of the project "Income distribution, asset prices and aggregate demand formation 1850-2010: A post-Keynesian approach to historical macroeconomic data", financed by the Institute for New Economic Thinking (2015-2018). The paper has been presented at Kingston University and Lund University; thanks to all the participants and to Erik Hegelund for helpful comments.

♣ Economic History Unit, University of Gothenburg, and Department of Economic History, Lund University. erik.bengtsson@econhist.gu.se

♠ Department of European & International Studies, King's College London. E.Stockhammer@kcl.ac.uk.

1. Introduction

In the mainstream economic history account of the "golden age" growth experience of Western Europe in the postwar era, wage restraint plays a key role. Eichengreen (1994, 2007) emphasizes that cross-class collaboration around wage restraint led to cautious, moderate wage policies on the behalf of workers, which was then compensated with high levels of investment. This caused – together with the favorable international conditions under the Bretton Woods regime – the high investment quotas and levels of GDP growth of the "golden age" , and stands out in stark contrast to the interwar years, where class conflict and trade unions' militant wage policies hurt profits and thus investments and growth (Broadberry and Ritschl 1995; Dimsdale, Horsewood, and van Riel 2006). A significant literature, not the least on Scandinavia, thus turned to studying institutional determinants of wage restraint, which was understood to be a positive outcome (Vartiainen 1998; Eichengreen and Iversen 1999; Alexopoulos and Cohen 2003).

However, the analysis of wage restraint as a fundamental factor behind GDP growth of the 1950s and 1960s has been questioned by Hatton and Boyer (2005) for the UK, and by Bengtsson (2015) for the three Scandinavian countries. The centre of attention in these studies was whether wages did in fact increase less than productivity in the postwar period, and whether there was more wage restraint in years with more centralized wage bargaining or not. For all four countries did the authors find that the excess of wage growth over productivity was larger in the postwar era 1945-73 than in the post-1973 era. In other words, wage restraint has been more prevalent since 1973. This goes well together with the well-known fact that capital shares have increased at the expense of wage shares since c. 1980 (Piketty and Zucman 2014), with the implication of increasing inequality (Bengtsson and Waldenström 2018). Since the economic crisis of 2008, several observers have pointed to that wage stagnation has gone hand in hand with rising profits but sluggish economic performance in terms of investments and growth (Harding 2013; Johnson 2013; Lavoie and Stockhammer 2013), and increased financial stability via increased leverage (Kumhof, Rancière, and Winant 2015). This experience reinforces the need to reconsider the postwar experience and the connection between wages and growth, which might not be as simple as has been assumed.

Based on a Keynesian model, we argue that the mainstream economic history understanding of wage restraint's effect on growth is one-sided, in that it only considers an investment effect, and not the connection between income distribution and consumption. To cite a recent contribution to macroeconomic debate, we need to "go beyond the

microeconomic view of wages as a cost that has negative consequences on the economy and to consider the positive macroeconomic dynamics associated with wages as a major component of aggregate demand" (Lavoie and Stockhammer 2013, p. 2). While the fact that high wages might induce innovation and more productive use of labour is of course not unknown to economic historians (Allen 2009), very few have examined the effects of wages on productivity in a modern setting; we integrate this aspect in our analysis. We use 100+ years of macroeconomic data for Denmark, Norway and Sweden to empirically examine the effects on consumption, investment, exports and productivity of the wage share. Thusly, the paper contributes a new perspective to the economic history understanding of wage bargaining, and the interconnection between distribution and growth.

2. Wages, factor shares and economic growth

How does wage growth affect economic performance? More specifically: GDP growth? In mainstream economic history, wage restraint (implying a falling, or at least not increasing, wage share) is associated with the strong GDP growth performance of the postwar period, in contrast with the weak growth of the chaotic interwar period, which was marked by class conflict (Broadberry and Ritschl 1995). The economic history studies typically do not formalize the relationship between wage restraint and growth, or investigate it econometrically, but it is argued that it increases GDP growth especially through a positive effect on investment, and possibly also on exports (through improved competitiveness). Thus there is a string of studies explaining high unemployment in interwar Germany (Dimsdale, Horsewood, and van Riel 2006), Britain (Broadberry and Ritschl 1995) and other countries such as Norway with high wages (Nordvik and Grytten 1994). The starting point was the study of Dimsdale, Nickell, and Horsewood (1989), which applied the Layard-Nickell model of how labour market inflexibility harms employment to the historical case of interwar Britain. In their analysis, Britain was hit by a large demand shock in 1929, and with sticky and even rising wages, unemployment was worsened. However, in their analysis, a fall in demand was still the major factor behind the historical increase in unemployment. The same is true for Dimsdale, Horsewood and van Riel (2006). According to their analysis, demand shocks explains 88.5 per cent of the increase in German unemployment 1928-32, but real wage growth caused by political influence over wages also contributed. They do not specify in the econometric analysis through which channels growing wages increased unemployment, but it should have been through investment and exports.

As we have seen, the interwar literature typically investigates the effects of wages on unemployment directly. In the postwar literature, the argument that wage restraint was present and good for growth is often made without any econometric investigation at all, as pointed out by Hatton and Boyer (2005, p. 43). However, Eichengreen and Vazquez (1999, Table 9) in an unpublished work do present econometric evidence that the wage share had a negative effect on investment in postwar Europe. In Eichengreen's (2007, p. 86) analysis, investments and international trade were the two major drivers of the great postwar growth experience, which does direct the attention to the effects of wages on exports and investment.

All the mentioned studies consider wages as a cost for the economy, not any possible positive effects through the channel of aggregate demand. Within the mainstream economic history discussion of the postwar growth experience, van Zanden (2000) is rather unique in his raising the possible positive effect of an increasing wage share on domestic consumption. In a fascinating study of postwar Netherlands, he points out that after a period of serious wage restraint during the reconstruction years of the second half of the 1940s, labour shortages and strong trade unions led to major increases in the wage share in the 1950s and 1960s. Profitability accordingly fell, and the real stock market wealth halved during the 1960s. Despite all of this, the investment share held up, and GDP growth was strong. His explanation is that the fast productivity growth of the 1950s had allowed very fast wage increases without harming profitability, and investors expected a continued pattern of this kind, also with continuously expanding export markets, until the 1970s, when business expectations took a beating with the oil price shock of 1973 and the following recession. Until then, the high wage increases had also increased consumer demand and thereby had a positive effect on growth (van Zanden, 2000, p. 550). A corresponding argument has been made for Sweden in the 1950s and 1960s by Bengtsson (2014, p. 304) who points out that "the very strong upward pressure on wages was in itself an important explanation of fast productivity growth of the period, as companies had to rationalise and scrap old machinery to stay profitable". Bengtsson (2015) generalizes this in discussing whether all-around growing wage shares in Western Europe during the postwar period could have beneficial effects on GDP growth through strong consumer demand and no labour-infighting between countries over competitiveness. The logic is simply that the marginal propensity to consume is assumed to be higher for wage-earners than for capital owners, so that an increasing wage share should increase consumption demand.

That a lack of wage pressure might slow down productivity growth is an acknowledged fact in the economic history literature on the interwar period. Low wage growth might stimulate employment growth, as in Dimsdale, Nickell and Horsewood (1989), but it might be low productivity jobs, with little incentive for rationalization. Temin (1990, p. 301) thus argues that low real wage growth in Nazi Germany 1932-37 stimulated employment growth, but not productivity growth, while New Deal-strengthened real wages in the US in the same period improved both productivity and competitiveness. This type of argument has in a more recent economic literature been applied to the post-1980 growth experience in OECD countries, with, as discussed above, lower wage pressure than in the postwar period. Naastepad (2006) argues, in a case study of the Netherlands, that an important cause behind the post-1980 productivity slowdown has been the fall in wage pressure. This is behind the Dutch "employment miracle": lower wages, less productivity, more jobs. Since the convulsions of the 2008 crisis and its aftermath, New Keynesian economists have also adapted the idea of wage-led productivity growth, albeit in a more ad hoc manner. So Simon Wren-Lewis, commenting on the UK economy, writes that "the period of stagnant wage growth we have had since the recession provided no incentive for firms to invest in higher productivity techniques."[1] In Wren-Lewis, declining wage pressure explains a part – but not the lion share – of the sub-par productivity performance of the UK after the crisis.

To sum up, following the criticism of Hatton and Boyer (2005) and Bengtsson (2015) of postwar wage restraint arguments, and van Zanden's (2000) inductive analysis of the combination of strong wage growth and strong GDP growth in postwar Netherlands, a new, integrated approach to the issues of wage formation and economic performance is needed. We therefore use a model which simultaneously considers the effects of the wage share on consumption, investment and exports, to comprehensively estimate the effects on GDP growth.

An analytical framework for estimating growth effects of changing capital-labour distribution

The Bhaduri and Marglin (1990) analysis of the interaction between capital-labour distribution and GDP growth has been very influential in Post-Keynesian economics,[2] but not

[1] Simon Wren-Lewis, "Underestimating the impact of austerity", Mainly Macro 7 May 2017. https://mainlymacro.blogspot.se/2017/05/underestimating-impact-of-austerity.html

[2] Post-Keynesian theory is a school of thought that emphasises that break between the Keynesian approach and neoclassical (mainstream) economics (Lavoie 2009, King 2002). In particular, they highlight the role of

in economic history research. However, we suggest that it is actually very relevant for the empirical concerns of the interaction between wage restraint, distribution and growth which have been discussed above. Bhaduri and Marglin clarified that depending on the different sensitivities of consumption, investment and exports to the wage bill and the profit sum, a capitalist economy can theoretically be either wage-led or profit-led. The scenario described by van Zanden (2000) for the Netherlands in the 1960s could in the Bhaduri and Marglin context be understood as a situation where rising wage shares through positive effects on demand facilitated strong economic growth, while Broadberry and Ritschl's (1995) analysis of the Weimar economy's problematic of rising wages strangling investment would be the "profit squeeze" scenario. The key point is that the sensitivities of consumption, investment and exports with regards to movements of the wage share are all estimated, and then weighted by their shares of GDP so that we can get to the effect on total GDP growth of a change in the wage share.

There are a string of studies following Bhaduri and Marglin, estimating the effects on consumption, investment and exports, and judging whether economies have wage-led or profit-led growth regimes (Naastepad and Storm 2006; Hein and Vogel 2008; Stockhammer, Onaran, and Ederer 2009; Stockhammer and Stehrer 2011; Onaran and Galanis 2014). For the postwar period, the majority of studies find wage-led domestic demand regimes in almost all countries, with the Anglo Saxon countries sometimes an exception. However, net exports turn some economies to a profit-led regime. The size of this effect depends critically on the degree of openness, how large the economy's dependence on exports is. However, a limitation of this literature is that it exclusively uses post-1960 data, as the widely used macroeconomic databases (AMECO, OECD and the like) only provide such data. This paper joins Stockhammer, Rabinovich, and Reddy (2018) in a new venture to apply the Bhaduri-Marglin model to historical data. While the previous paper focuses on four large economies in Britain, France, Germany and the United States, this paper studies the three small, open Scandinavian economies, which have played a special role in the understanding of corporatism, wage restraint and their consequences for GDP growth (Katzenstein 1985; Moene and Wallerstein 1995; Alexopoulos and Cohen 2003).

fundamental uncertainty, non-rational behaviour and financial instability. Unlike the New Keynesians they reject the claim that macroeconomics should be built on rational behaviour microfoundations. Rather economic behaviour has to analysed in its institutional and historical conditions and the macroeconomic sphere can have emergent properties that are nort readily reducible to microbehaviour. Post-Keynesians do have a central role for income distribution in demand formation, which goes back to Keynes (1936, chap. 19) claim that wage cut in a recession can be counterproductive.

Bhaduri and Marglin focused on the demand side of the economy; later developments have added the supply side to the discussion of wage share effects. Specifically, the effects of wage pressure on productivity growth have been studied. Naastepad (2006) in the above mentioned study of the Netherlands applies a model where productivity is driven by capacity utilization (the so-called Verdoorn effect), and by real wage growth. Wage growth increases productivity by inducing labour saving innovations. Following studies have generalized this approach to a broader set of countries post-1960, but used the wage share as the independent variable instead of real wage growth, arguing that "wage growth will only give an additional push to capitalists' efforts to implement technical progress if it exceeds productivity growth and downward pressure on the profit share or on unit profits is exerted" (Hein and Tarassow 2010, p. 735). These studies work within the same post-Keynesian tradition as Bhaduri and Marglin, but the logic is applied in New Keynesian discussions too; Pessoa and Van Reenen (2013) argue that the weakening of unions and job protection means that real wages in the UK in the post-2008 recession fell more steeply than they used to in recessions, and that the fall in real wages led to capital shallowing and a decrease in productivity. This is the same logic as in Naastepad's argument, but applied to the short run and with a more sanguine evaluation of the problem; Pessoa and Van Reenen argue that expansive fiscal and monetary policy to increase demand can alleviate the productivity problem by increasing investment, without any reforms to wage setting institutions. With our long run perspective, the important aspect is just to bring in that the causal relationship between productivity and wages isn't just from the former to the latter, but also the opposite. As a stylized fact, we can say that trade unions were exceptionally strong in Scandinavia in the 1950s, 1960s and 1970s, and that their wage setting clout has been eroded since the 1980s by globalization, deindustrialization, individualized wage bargaining and other factors. Wage pressure has been lower since 1980 (Bengtsson 2015) and we may then ask if this has had consequences for productivity growth.

The Bhaduri-Marglin model

We will use general consumption (C) and investment (I) functions that depend on income (Y), the functional distribution of income measured by the wage share (WS):

$C = C(Y, WS)$, with $\partial C/\partial Y, \partial C/\partial WS > 0$

Consumption depends positively on income ($\partial C/\partial Y > 0$). Following a long tradition in classical and post-Keynesian theory we assume that the marginal propensity to consume is higher for

workers (or recipients of wage incomes) than for capitalists (or recipients of capital incomes). Thus, a higher wage share will positively affect consumption ($\partial C/\partial WS > 0$). Mainstream (neoclassical) economics usually does not attribute much importance to the function distribution of income in its consumption theory, but the fact that the rich have higher lower marginal propensity to consume than the poor is widely accepted, thus this equation is not necessarily in contradiction to standard theory.

The investment function

$I = I(Y, WS, i)$, with $\partial I/\partial Y > 0$, $\partial I/\partial WS$, $\partial I/\partial i < 0$

depends on income, the wage share and the (real) rate of interest (i). There is little disagreement that income will have positive effects on investment. The accelerator hypothesis claims that the *change* in demand will affect (the level of) investment. If firms are credit constrained (Stiglitz and Weiss 1981), then higher profits will allow firms to investment more. Additionally, firms may interpret current profits as predictor of future profits.

Exports, X, are positive function of foreign demand, Z, the wage share and the exchange rate, E. The wage share is regarded as proxy for unit labour costs and thus competitiveness. An increase in the wage share will either increase export prices or squeeze profit margins.

$X = X(Z, WS, E)$, with $\partial X/\partial Z > 0$, $\partial X/\partial WS < 0$

Similarly imports, M, are positive function of domestic demand, a positive function of the wage share and of the nominal exchange rate

$M = M(Y, WS, E)$, with $\partial X/\partial Y$, $\partial X/\partial WS > 0$

Aggregate expenditures equal consumption, investment, net exports ($NX=X-M$) and government consumption (G):

$$Y = C + I + G + NX$$

Bhaduri and Marglin (1990) proposed a general macroeconomic framework that allows for wage-led as well as for profit-led demand regimes. This has become an important reference point for post-Keynesian macroeconomics because it includes the Kaleckian consideration,

with consumption demand coming from workers' income, as well the central role of profitability for investment in classical economics.

In this paper, like much of the literature, we take government expenditures as exogenously given. Differentiating equilibrium income, Y*, with respect to the wage share gives:

$$\frac{dY^*}{dWS} = \frac{h_2}{1-h_1}, \qquad where\ h_2 = \frac{\partial C}{\partial WS} + \frac{\partial I}{\partial WS} \quad and\ h_1 = \frac{\partial C}{\partial \mathrm{Y}} + \frac{\partial I}{\partial \mathrm{Y}} + \frac{\partial NX}{\partial \mathrm{Y}}$$

The numerator of this equation, h_2, is the partial effect of a change in distribution on the domestic demand components, which is also called private *excess* demand: the increase in demand due to a distributive change *for a given level of income*. The denominator $\frac{1}{1-h_1}$ is similar to a standard multiplier but includes investment effects. It measures the second-round effects of changes in distribution. Assuming that the multiplier is positive, the sign of the total effect of a change in income distribution will depend on the sign of the effect on excess demand, i.e. h_2. The overall distributive dynamics of the economy will be determined by the relative strength of consumption and investment responses to higher wage shares. If higher consumption more than outweighs the reduction of investment due to lower profit margins, the economy as a whole will be wage-led ($\frac{dY^*}{dWS} > 0$). In the reverse case it will be profit-led ($\frac{dY^*}{dWS} < 0$).

Demand regimes measure the effect of a one unit change in income distribution on aggregate demand. Changes in functional income distribution also have supply-side effects. In particular, higher wage growth may induce firms to rationalize production processes and higher pay may elicit higher work effort (Akerlof 1982; Shapiro and Stiglitz 1984); both of these mechanisms raise productivity (Storm and Naastepad 2013). Within the Bhaduri-Marglin model productivity growth is thus usually modeled as positive function of the wage share and positive function of (past) output growth, which captures dynamic returns to scale (sometimes also referred to as the Kaldor-Verdoorn law)

$\dot{x} = x(\dot{WS}, \dot{y})$, where $\frac{\partial \dot{x}}{\partial \dot{WS}}$, $\frac{\partial \dot{x}}{\partial \dot{y}} > 0$

3. Empirical approach

Following the theoretical discussion in section 2, we will investigate the effects of changing labour-capital distribution (the wage share) on consumption, investment, exports, imports, and labour productivity.

To identify the appropriate time series specification, we first test for cointegration by estimating error correction models (ECM). We use critical values of Banerjee, Dolado, and Mestre (1998), but will regard cointegration as plausible if coefficient estimate for the error correction term shows a t-value of 3 or above. When we fail to find evidence for cointegration, we estimate distributed lag models in difference form. For all cases we choose specifications based on the Akaike and Bayesian Information Criteria. Beyond this selection, we do report specifications with and without contemporaneous effects, because the former may suffer from endogeneity. All variables involved except the interest rate are in logarithm form.

For consumption, the full ECM regression estimated is:

Equation 1. $\Delta\, logC = \rho\, logC_{t-1} + \beta 1 \log Y_{t-1} + \beta 2\, logWS_{t-1} + \sigma 1 \Delta\, Y + \sigma 2 \Delta\, logWS + \alpha$

For investment, the model is the same but with the real interest rate included among the independent variables. For exports, the model is as follows:

Equation 2. $\Delta \log X = \rho\, X_{t-1} + \beta 1 \log Z + \beta 2 \log WS + \beta 3\, E + \sigma 1 \Delta\, Z + \sigma 2 \Delta\, WS + \sigma 3 \Delta\, E + \alpha$

Productivity is heavily autocorrelated and we use first difference models with a lagged, differenced dependent variable. The productivity equation is as follows:

Equation 3. $\Delta \log P = \sigma 1\, \Delta P_{t-1} + \sigma 2\, Y_{t-1} + \sigma 3\, WS_{t-1} + \sigma 4\, Y_{t-2} + \sigma 5\, WS_{t-2} + \alpha$

Because of the long time span, year dummies will also be used, for years during the World Wars when other forces heavily influence GDP components.

The postwar period is considered as a special period in European economic history (cf. Eichengreen 2007), and we will explore if the relationship between the wage share and

economic performance indeed was different in this period than before or after. For this reason, we explore post-war specific effects by including interactions with a postwar (1945-73) time dummies. For simplicity, we will only consider interaction with the wage share variable. We have also made the calculations with corresponding sub-samples; however, this steeply decreases the degrees of freedom. For this reason, we prefer period dummy interactions for explore period-specific effects.

Data

We apply the models discussed above to data for Denmark 1900-2010, Norway 1910-2010, and Sweden 1900-2010.[3] The data thus covers the interwar and postwar periods discussed in section 2, as well as the post-1980 period with a quite different wage formation pattern (Hatton and Boyer 2005; Bengtsson 2015). The long run datasets that we use build on recent historical national accounts research, not the least executed under the auspices of central banks. GDP and its components (consumption, investment, exports, imports) are gathered from Kaergård (1991) and Statistics Denmark for Denmark, Grytten (2004) for Norway, and Krantz and Schön (2015) for Sweden. The wage share is the adjusted wage share of GDP, i.e. including imputed labour incomes of the self-employed. Wage shares are taken from Abildgren (2008) for Denmark, Bengtsson and Waldenström (2018) for Norway, and Edvinsson (2005) for Sweden; in the Danish and Swedish cases, we link the historical estimates with those from AMECO for recent years. To measure the conditions for exports, we measure trade partners' GDP growth. For this we have taken the five largest export destinations of the country in question, taken the GDP growth of each of those five countries in a given year, and calculated a trade share-weighted partners' GDP growth. Trade partners' GDP growth has been calculated using Maddison et al (2013), Abildgren, Grytten and Hills et al (2013) and trade shares from Abildgren (2010), table A3.1, SSB (1968), Tables 152 & 164, and SCB (1972), p. 298. The exchange rate is that of the country's currency to a basket of currencies, typically of the country's main trading partners.[4] They are from Abildgren (2005), Klovland (2004), and Bohlin (2010). Interest rates are from Abildgren (2006), Eitrheim and Klovland (2007), and Waldenström (2014) The productivity variable is for Sweden real value

[3] In Denmark, there are two gaps in the macroeconomic data: 1915-1920, and 1940-1946. In the Norwegian data, there is one gap: 1940-1945.

[4] With the exchange rates, it is important to note whether it is coded so that an increase in the index means an appreciation or a depreciation. For Norway and Sweden, an increase means depreciation. For Denmark on the other hand an increase means appreciation of the DKK against a basket of currencies.

added per employee from Krantz and Schön (2015), for Norway real output per hour from Bore and Skoglund (2008), and for Denmark real output per hour from Abildgren (2008, Table A6).

4. Results: distribution and growth in Scandinavia

We begin with the archetypical example of Social Democracy and Social Democratic wage bargaining institutions, Sweden (Vartiainen 1998; Alexopoulos and Cohen 2003). Swedish investment but not consumption are cointegrated. Therefore, we use error correction models for investment, but first differences models for consumption. The information criteria indicate that for consumption, the models with 1+2 or 1+2+3 lags are the best, even though the adjusted r2 drops when we lose the contemporary effect of Y. Columns 1-3 of Table 1 show the different specifications for consumption.

The wage share has an increasing effect on consumption, 0.30 to 0.32. The effects on investment (columns 4-6) are not statistically significant. We fail to find significant postwar period-specific effects, so those results are not reported here. The results for Swedish exports and imports are shown in Table 2. Neither exports nor imports are cointegrated, so we report first differences results. For exports the best-fitting models according to the information criteria are the ones without contemporaneous effects; in these, the estimated effect of the wage share is perversely positive. However, when the contemporaneous effect is included (column 3), the effect is as expected negative. This highlights the importance of controlling for several lags. Our preferred specification, then, indicates that the effect of the wage share on exports is -0.75. Trade partners' GDP growth has very strong effects on exports, around unity. A depreciation of the exchange rate does not have significant effects. Over all, the Swedish results are as expected: growing wages as a share of national income does boost consumption and dampen exports.

We find Danish consumption not to be cointegrated, so Table 3 reports FD results. In our preferred specification (as it combines better scores on AIC and BIC, with simpler lag structure), with 1 and 2 lags, the wage share increases consumption by 0.22, or 0.17 when we discount the non-significant negative coefficient of the first lag. The effect of the wage share on consumption does not seem to vary over time.

Table 1. Consumption and investment in Sweden

	Consumption			Investment	
	(1)	(2)	(3)	(4)	(5)
Investment t-1				-0.14***	-0.12***
				(-3.46)	(-2.88)
Y t-1				0.19***	0.16***
				(3.53)	(2.87)
Wage share t-1				-0.08	-0.04
				(-0.67)	(-0.37)
Interest rate t-1				-0.00***	-0.00***
				(-3.62)	(-2.79)
Δ Y t	0.91***			2.04***	2.03***
	(11.83)			(8.06)	(7.62)
Δ Wage share t	0.06			-0.22	-0.22
	(0.84)			(-0.82)	(-0.80)
Δ Interest rate t				-0.00**	-0.00***
				(-2.47)	(-2.73)
Δ Y t-1	0.12	0.47***	0.45***	0.49*	0.60**
	(1.53)	(3.68)	(3.49)	(1.90)	(2.18)
Δ Wage share t-1	0.02	0.18	0.17	-0.33	-0.13
	(0.22)	(1.50)	(1.46)	(-1.41)	(-0.51)
Δ Interest rate t-1				0.00	-0.00
				(0.30)	(-0.48)
Δ Y t-2	0.07	-0.02	0.00		-0.55**
	(0.97)	(-0.17)	(0.01)		(-2.08)
Δ Wage share t-2	0.05	0.30***	0.32***		-0.24
	(0.79)	(3.01)	(2.91)		(-1.06)
Δ Interest rate t-2					0.00
					(0.33)
Δ Y t-3			-0.05		
			(-0.43)		
Δ Wage share t-3			0.05		
			(0.46)		
Constant	-0.01**	0.01*	0.01*	-0.44	-0.44
	(-2.17)	(1.90)	(1.87)	(-0.91)	(-0.88)
Durbin-Watson d	1.97	2.19	2.16	1.87	1.92
AIC	-641	-455	-452	-307	-307
BIC	-594	-417	-408	-261	-253
Observations	133	111	111	111	111
Adjusted R-squared	0.74	0.50	0.49	0.65	0.66

T-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
Year dummies not reported: in consumption regressions 1914, 1918, 1919, 1920, 1921, 1940, 1941, 1945, 1946. In investment regressions, 1915, 1916, 1940, 1942, 1945, 1946.

Table 2. Exports and imports in Sweden

	Exports			Imports		Period-specific effects on exports
	(1)	(2)	(3)	(4)	(5)	(6)
Δ Y t					1.11***	
					(3.38)	
Δ Trade partners' Y t			0.92***			0.97***
			(5.97)			(6.03)
Δ Wage share t			-1.05***		-0.68**	-0.99***
			(-4.42)		(-2.07)	(-4.01)
Δ Exchange rate t			-0.21		-0.18	-0.21
			(-1.61)		(-1.01)	(-1.62)
Δ Y t-1				0.55	0.25	
				(1.56)	(0.75)	
Δ Trade partners' Y t-1	0.75***	0.88***	0.26			0.41
	(2.71)	(3.28)	(1.14)			(1.53)
Δ Wage share t-1	0.16	0.32	0.11	-0.12	-0.25	0.17
	(0.55)	(1.12)	(0.50)	(-0.33)	(-0.78)	(0.71)
Δ Exchange rate t-1	-0.10	0.02	-0.11	-0.44**	-0.48***	-0.12
	(-0.60)	(0.10)	(-0.83)	(-2.44)	(-3.10)	(-0.91)
Δ Y t-2				-0.75*	-0.76**	
				(-1.96)	(-2.23)	
Δ Trade partners' Y t-2	0.25	0.50*	0.40*			0.50**
	(0.88)	(1.77)	(1.81)			(2.03)
Δ Wage share t-2	0.77***	0.49*	0.39*	0.42	0.03	0.43*
	(2.88)	(1.82)	(1.84)	(1.45)	(0.11)	(1.75)
Δ Wage share t-2 * postwar						0.02
						(0.05)
Δ Exchange rate t-2	0.00	0.08	0.01	0.03	-0.10	0.00
	(0.01)	(0.48)	(0.09)	(0.17)	(-0.64)	(0.01)
Δ Y t-3					-0.01	
					(-0.02)	
Δ Trade partners' Y t-3		-0.62***	-0.47***			-0.47**
		(-2.83)	(-2.68)			(-2.61)
Δ Wage share t-3		0.03	-0.20		-0.41	-0.17
		(0.12)	(-1.03)		(-1.59)	(-0.85)
Δ Exchange rate t-3		-0.25	-0.20		-0.01	-0.21*
		(-1.62)	(-1.63)		(-0.04)	(-1.72)
Postwar dummy						-0.02
						(-1.10)
Constant	0.02	0.03*	0.02*		0.04**	0.02
	(1.40)	(1.76)	(1.91)		(2.00)	(1.57)
Durbin-Watson d	2.00	2.02	2.15	2.13	2.24	2.16
AIC	-248	-255	-306	-237	-267	-304
BIC	-199	-198	-241	-183	-197	-233
Observations	111	111	111	111	111	111
Adjusted R-squared	0.68	0.70	0.82	0.82	0.87	0.81

T-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Year dummies not reported: in X models 1915, 1916, 1917, 1918, 1920, 1921, 1940, 1943 and 1945; in M models 1914, 1915, 1916, 1917, 1919, 1920, 1921, 1940, 1941, 1942, 1943, 1945, 1946.

Table 3. Consumption and investment in Denmark

	Consumption				Investment		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Δ Y t			0.83***	2.27***			
			(11.45)	(8.78)			
Δ Wage share t			-0.11	0.23			
			(-1.40)	(0.90)			
Δ Y t-1	0.12	0.15	0.18**	-0.20	-0.25	-0.11	-0.31
	(1.04)	(1.23)	(2.32)	(-0.73)	(-0.65)	(-0.28)	(-0.77)
Δ Wage share t-1	-0.05	-0.08	0.07	-0.53**	-0.94**	-1.26***	-1.08***
	(-0.41)	(-0.60)	(0.88)	(-2.17)	(-2.38)	(-2.97)	(-2.68)
Δ Wage share t-1 * postwar							1.04
							(0.99)
Δ Y t-2	-0.20	-0.17	-0.09		-0.51	-0.48	-0.74
	(-1.51)	(-1.33)	(-1.20)		(-1.18)	(-1.13)	(-1.66)
Δ Wage share t-2	0.22*	0.20	0.12		-0.08	-0.49	-0.22
	(1.89)	(1.59)	(1.59)		(-0.20)	(-1.20)	(-0.59)
Δ Y t-3		-0.11	-0.18**			0.84*	
		(-0.79)	(-2.31)			(1.94)	
Δ Wage share t-3		-0.05	-0.09			0.39	
		(-0.43)	(-1.22)			(1.03)	
Postwar dummy							0.03
							(1.44)
Constant	0.02***	0.03***	0.00	-0.03***	0.04**	0.01	0.04**
	(4.34)	(3.94)	(0.69)	(-2.93)	(2.09)	(0.61)	(2.00)
Durbin-Watson d	1.79	1.92	1.92	2.16	1.80	1.95	1.81
AIC	-388	-376	-471	-251	-172	-170	-172
BIC	-373	-356	-447	-236	-157	-150	-152
Observations	91	89	89	93	92	90	92
Adjusted R-squared	0.07	0.05	0.68	0.54	0.09	0.14	0.11

T-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1. In C models: 1914 dummy not reported.

While the wage share increases consumption, as expected it hurts investment (columns 4-6). There is a very strong accelerator effect in investment, as it increases about 2.3 per cent for each per cent growth in GDP. The estimated negative effect of wage share growth vary between -0.53 and -1.26 depending on the specification. While the postwar dummy interaction (column 7) does not reach statistical significance at the 10 % level, the results are indicative. They indicate that in the postwar period, the wage share had a very weakly negative effect on investment: while the coefficient for the wage share t-1 is -1.08, the coefficient for the interaction is 1.04. These results correspond very well to the finding of Hatton and Boyer (2005) that wage pushes in postwar Britain had no negative effect on employment, while post-1980 they had rather large negative effects.

As expected, trade partners' GDP growth exerts strong effects on Danish exports; in the three specifications in Table 4, the effect is between 1.07 and 1.37. The effect of the wage share is negative in specification one which includes contemporaneous effects, -0.98, but slightly positive in specification two, which does not include contemporaneous effects, 0.51. Effects are not different in the postwar period than overall.

For Norwegian consumption and investment, we report error correction models with a variety of lag structures. Table 5 contains the models with the best fit (models with contemporaneous effects for consumption are not cointegrated) according to the information criteria, and the results indicate that the wage share has little effect on consumption; however the once lagged increase has the coefficient 0.14 and t-values around 1.5, so almost statistically significant. For investment, the effect is more negative than not; according to one of the models the long-run effect on investment is -1.92 (column 5), but the other finds -1.31 and not statistically significant (column 4).

Norwegian exports are not cointegrated, so we use first differences models. Without contemporaneous effects the specifications suffer from autocorrelation, so our models of choice are the FD with 0 or 0+1 lags (columns 1 and 2). The same is true for imports; the international sector is shown in Table 6.

Trade partners' GDP growth, not surprisingly, is the most important driver of exports. A depreciation of the currency also boosts exports, with an effect at 0.05 with a one year lag (columns 1 and 2). Conversely, that depreciation would harm imports, by about -0.07 (column 4). Imports seem to be positively related to the wage share, but the statistical significance is unstable. The wage share has no stable effect on exports either. However, in the postwar period (column 3), the effect was actually positive, as a whole 0.50.

Table 4. Exports and imports in Denmark

	Exports		Imports	
	(1)	(2)	(3)	(4)
Δ Y t			0.67**	
			(2.06)	
Δ Trade partners' Y t	1.20**			
	(2.00)			
Δ Wage share t	0.20		-0.63*	
	(0.67)		(-1.93)	
Δ Exchange rate t	-0.31		-0.21	
	(-0.85)		(-0.84)	
Δ Y t-1			0.24	0.16
			(0.72)	(0.52)
Δ Trade partners' Y t-1	-0.39	1.37***		
	(-0.79)	(3.07)		
Δ Wage share t-1	-0.98**	-0.54*	-0.76**	-0.85***
	(-2.49)	(-1.87)	(-2.43)	(-2.74)
Δ Exchange rate t-1	-0.53	0.96***	0.13	0.21
	(-1.55)	(3.17)	(0.57)	(0.90)
Δ Y t-2				-0.45
				(-1.44)
Δ Trade partners' Y t-2		-2.11***		
		(-5.59)		
Δ Wage share t-2		1.05***		0.67**
		(3.93)		(2.31)
Δ Exchange rate t-2		-0.77***		0.07
		(-2.79)		(0.30)
Δ Trade partners' Y t-3				
Δ Wage share t-3				
Δ Exchange rate t-3				
Constant	0.04**	0.06***	0.00	0.03**
	(2.08)	(4.66)	(0.06)	(2.34)
Durbin-Watson d	1.57	1.63	1.75	2.28
AIC	-136	-186	-203	-211
BIC	-91	-141	-185	-194
Observations	103	104	85	84
Adjusted R-squared	0.67	0.79	0.23	0.17

T-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Year dummies in X models not reported: 1915, 1917, 1918, 1920, 1940, 1941, 1942, 1943, 1945 and 1946.

Table 5. Consumption and investment in Norway

	Consumption			Investment	
	(1)	(2)	(3)	(4)	(5)
Dependent variable t-1	-0.23***	-0.26***	-0.27***	-0.13**	-0.13**
	(-3.13)	(-3.64)	(-3.33)	(-2.31)	(-2.54)
Y t-1	0.19***	0.22***	0.23***	0.13**	0.14***
	(3.23)	(3.72)	(3.42)	(2.38)	(2.77)
Wage share t-1	0.03	0.02	-0.01	-0.17	-0.24**
	(0.60)	(0.40)	(-0.25)	(-1.48)	(-2.15)
Wage share t-1 * postwar			0.08		
			(0.85)		
Interest rate t-1				0.00	0.00
				(1.54)	(1.32)
Δ Y				2.23***	2.39***
				(6.92)	(8.07)
Δ Wage share				-0.07	-0.26
				(-0.37)	(-1.32)
Δ Interest rate				-0.00	0.00
				(-0.25)	(0.72)
Δ Y t-1	0.03	-0.06	-0.07		1.30***
	(0.29)	(-0.48)	(-0.61)		(4.28)
Δ Wage share t-1	0.14	0.14	0.14		0.20
	(1.51)	(1.52)	(1.49)		(0.98)
Δ Interest rate t-1					0.00
					(0.55)
Δ Y t-2		-0.30**	-0.31**		
		(-2.56)	(-2.60)		
Δ Wage share t-2		0.09	0.10		
		(0.92)	(1.03)		
Constant	0.20	0.30	0.46	0.40	0.54
	(0.85)	(1.26)	(1.50)	(0.81)	(1.11)
Durbin-Watson d	1.89	1.72	1.75	1.86	2.00
AIC	-346	-342	-340	-199	-210
BIC	-323	-315	-308	-169	-173
Observations	88	86	86	90	88
Adjusted R-squared	0.38	0.44	0.43	0.76	0.81

T-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Year dummies not reported: in C models 1915, 1916, 1919, in I models 1917, 1918, 1919, 1920.

Table 6. Exports and imports in Norway

	Exports			Imports	
	(1)	(2)	(3)	(3)	(4)
Δ Y t				2.62***	2.33***
				(6.39)	(6.73)
Δ Trade partners' Y t	0.77***	0.85***	0.73***		
	(3.44)	(3.67)	(3.13)		
Δ Wage share t	-0.18	-0.13	-0.20*	-0.03	0.09
	(-1.62)	(-1.05)	(-1.78)	(-0.12)	(0.46)
Δ Exchange rate t	0.02	0.02	0.02	-0.02	0.00
	(1.04)	(1.22)	(0.98)	(-0.43)	(0.06)
Δ Y t-1				0.36	-0.50
				(1.00)	(-1.44)
Δ Trade partners' Y t-1	-0.14	-0.21	-0.22		
	(-0.68)	(-0.92)	(-1.01)		
Δ Wage share t-1	0.22*	0.17	0.12	0.42*	0.27
	(1.81)	(1.33)	(0.95)	(1.67)	(1.27)
Δ Wage share t-1 * postwar			0.58*		
			(1.86)		
Δ Exchange rate t-1	-0.05**	-0.05***	-0.06***	0.07	0.11***
	(-2.63)	(-2.66)	(-2.84)	(1.57)	(2.80)
Δ Y t-2					-0.95***
					(-3.47)
Δ Trade partners' Y t-2		0.15			
		(0.72)			
Δ Wage share t-2		0.15			0.16
		(1.20)			(0.74)
Δ Exchange rate t-2		0.03			-0.18***
		(1.53)			(-4.79)
Postwar dummy			0.00		
			(0.32)		
Constant	0.04***	0.03***	0.04***	-0.06**	0.02
	(4.38)	(3.10)	(4.57)	(-2.47)	(0.89)
Durbin-Watson d	1.63	1.57	1.56	1.98	2.16
AIC	-306	-297	-306	-175	-202
BIC	-274	-258	-269	-143	-163
Observations	88	86	88	88	86
Adjusted R-squared	0.74	0.75	0.75	0.59	0.73

t-statistics in parentheses. Year dummies not reported: in X models, 1914, 1916, 1917, 1918, 1920, 1921; in M models, 1914, 1916, 1917, 1918, 1920, 1921.

Productivity

The effect of wage share growth on productivity is an old debate. Temin (1990), Naastepad (2006) and others have shown how slow wage growth can facilitate expansion of low-productive employment. One of the central motivations of the Swedish post-war wage bargaining model, the Rehn-Meidner model, was precisely to push up wages to hamper the

expansion of low-productive companies and instead let workers transfer to the productivity leaders (Erixon 2008). The solidaristic element of the wage policy was to hold back wage increases for the highest paid. To investigate the effects of wages on productivity in line with this logic, we use first differences specifications; because of reverse causality issues we use models with lagged explanatory variables only and experiment with one to three lags. The results, summarized in Table 7, are strikingly similar across the countries. A one percentage point increase in the wage share increases productivity growth by about 0.2 percent in Sweden, 0.3 percent in Denmark, and 0.4 percent in Norway. In all cases theres effects are statisictically significant at the 5% level or higher. The lag structure differs, with effects materializing within one year in Norway and Denmark, but two years in Sweden.

This is very much in line with familiar results from Temin (1990) and Wright (2006) that strong wage growth, such as in the United States in the 1920s, can boost productivity growth, and that conversely, weak wage pressure can give employment growth with torpid productivity (Naastepad 2006). It is also in line with the Rehn-Meidner model and its followers in Denmark and Sweden. Thus, while our calculations indicate that wage share growth over the long run has had weakly negative effects on GDP growth in Denmark and Norway (but weakly positive in Sweden), we should also consider what kinds of GDP growth it is. Wage-driven growth is more high productive and thus in some sense of higher quality.

Table 7. Productivity in Sweden, Denmark, and Norway

	Sweden		Denmark		Norway	
	(1)	(2)	(3)	(4)	(5)	(6)
Δ Productivity t-1			0.23*	0.28**	0.50***	0.50***
			(1.98)	(2.34)	(4.98)	(4.80)
Δ Y t-1	-0.01	-0.06	0.12	0.14	0.21	0.28
	(-0.19)	(-0.70)	(1.37)	(1.57)	(0.83)	(1.02)
Δ Wage share t-1	-0.08	-0.08	0.35***	0.29***	0.44**	0.40*
	(-0.97)	(-1.07)	(4.63)	(3.54)	(2.34)	(1.91)
Δ Y t-2	-0.02	0.04	-0.16*	-0.16*	0.18	0.14
	(-0.19)	(0.41)	(-1.88)	(-1.96)	(0.65)	(0.57)
Δ Wage share t-2	0.16**	0.18**	-0.00	-0.05	-0.09	-0.08
	(2.08)	(2.18)	(-0.04)	(-0.59)	(-0.40)	(-0.39)
Δ Y t-3		-0.05		0.08		0.17
		(-0.65)		(0.95)		(0.66)
Δ Wage share t-3		0.04		-0.02		-0.04
		(0.51)		(-0.30)		(-0.16)
Constant	0.02***	0.02***	0.02***	0.02***	0.00	-0.01
	(6.10)	(6.07)	(5.89)	(3.94)	(0.06)	(-0.47)
Durbin-Watson d	2.04	1.98	1.88	2.14	1.94	1.86
AIC	-597	-598	-469	-456	-198	-188
BIC	-574	-569	-449	-431	-184	-169
Observations	133	132	90	88	82	80
Adjusted R-squared	0.20	0.21	0.58	0.58	0.31	0.29

t-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Denmark: 1915 and 1940 dummies not reported. Sweden: Year dummies 1918, 1942 and 1946 not reported. Effects do not change over time in Denmark. Using real wage instead of the wage share still gets an effect around 0.2, with no time varying effects. Only looking at manufacturing sector in Sweden does not make a difference.

Summary of the results

Table 8 weights together the results, showing the implications for GDP growth and more specifically for demand growth. Here the coefficients from our preferred specifications are weighted by their shares of GDP of C, I and X. In Sweden, our benchmark specifications a one point increase in the wage share increases consumption by 0.48, and decreases investment by -0.92 (although this was just statistically significant). Exports decrease by 0.32. When we consider the relative roles of C, I and X in GDP growth, a one point increase in the wage share boosted growth by 0.07 % in Sweden 1900-2010, so growth was weakly wage-led. Furthermore, as we have seen, wage pressure has over time boosted labour productivity in Scandinavia, completely in line with the Rehn-Meidner model of wage pressure and rationalization (Erixon 2008).

For Denmark, according to our preferred specifications, a one point increase in the wage share in total for the period 1900-2010 has a slightly negative effect of GDP, -0.23 per cent. However, in the postwar period, due to the smaller negative effect on investment, GDP growth was actually very weakly wage-led, or at least neutral. In the post-1980 period, because of larger dependence on exports and smaller reliance on private consumption, the negative effects of growing wage shares on GDP growth are larger. In Norway, the effects on investment dominate the others, so that overall, the growth regime is profit-led.[5] However, in the post-war period, this is only weakly so. We may note that one reason that the regime is profit-led in Norway according to our calculations is a very low share of private consumption in GDP.

Table 8. Demand effects of a one point increase in the wage share

	Sweden				Denmark				Norway			
	Total	C	I	X	*Total*	C	I	X	*Total*	C	I	X
Full sample	0.07	0.34	-0.16	-0.11	-0.23	+0.14	-0.20	-0.17	-0.25	+0.07	-0.31	-0.01
Postwar	0.08	0.35	-0.19	-0.08	+0.02	+0.10	-0.01	-0.07	-0.18	+0.07	-0.36	+0.11

Note. Calculations for postwar period based on period-specific coefficients when they differ from the overall (t-value at least 1 for interaction), and based on period-specific shares of GDP.

What does all this mean for our interpretation of the Scandinavian growth experience in the 1945-73 period? In mainstream accounts, this was an epoch of wage restraint (Alexopoulos and Cohen 2003; Eichengreen 2007). However, in reality, wages increased more than productivity, meaning that wage shares grew. In Sweden, GDP grew by 111 % from 1945 to 1973 and the wage share by 13 %. This wage share growth increased GDP by 1.04 % following the calculations in Table 8, i.e. a miniscule share of the total. In Denmark GDP grew 129 per cent from 1948 to 1973, and the wage share 4.6 per cent. The growth of the wage share thus contributed to GDP growth by 0.09 per cent. A positive effect but so small as to be negligble. In Norway, GDP grew by 254.9 % 1946-73 and the wage share by 14.8 %.

[5] It should be noted that private consumption is very low as a share of GDP in Norway according to the national accounts. See Appendix Table 1, which shows that the private consumption shares of GDP over the studied period are 61.4 in Denmark and 71.7 per cent in Sweden, but only 52.6 in Norway. This means that the positive consumption effects are given a low weight in Table 8, which pushes the results into profit-driven. We are not aware of any differences in the practices of national accounting which would cause this divergence, so have to assume that the figures are correct.

The growth in the wage share depressed GDP by 2.7 per cent, again a neglible amount in the grand scheme of things.

In sum, while growing wage shares might not have been a quantitatively important cause behind the strong growth performance of these three countries in the postwar period, it was certainly not wage restraint which caused the good growth. There was no wage restraint (cf. Hatton and Boyer 2005; Bengtsson 2015), but rather wages grew faster than productivity, and this had weakly positive effects on growth in Denmark and Sweden, and weakly negative effects in Norway.

5. Concluding discussion

Our investigation has shown that the implications of wage bargaining for macroeconomic performance are more complex than is assumed in the standard narrative of wage restraint having facilitated rapid economic growth in the post-war period through the channel of increasing investment (Eichengreen 1994; Moene and Wallerstein 1995; Alexopoulos and Cohen 2003; Eichengreen 2007). As van Zanden (2000) has shown in the case of the Netherlands, high wage pressure could be combined with high investment rates, not the least because high wage increases guaranteed a healthy growth of consumption demand. The pro-labour distribution of the postwar period could then through Keynesian effects boost economic growth, just as outlined in Bhaduri and Marglin's (1990) model. Among the three Scandinavian countries, for Denmark and Sweden we find quite small negative effects of the wage share on investment.But investment is only one component of demand. Wage share growth is associated with more consumption demand, which offers room for expanding production. Furthermore, in all three countries, wage growth is associated with higher productivity growth in following years, very much in line with classical arguments about wage-induced innovation (Allen 2011).

In this way, with a thorough consideration of the effects of labour-capital distribution on consumption, investments, exports and productivity, can we reconcile the fact that the European countries experienced both exceptional GDP growth and substantial redistribution from capital to labour during the post-war period (van Zanden 2000; Hatton and Boyer 2005; Bengtsson 2015). Wage restraint is not necessarily, always positive for growth. This insight might facilitate a more nuanced understanding of the post-war growth miracle. More recent interpretations of the postwar golden growth experience have already turned away from wage-centred explanations (Vonyò 2008; Eichengreen and Ritschl 2009), and of course, some never

focused on this factor in the first place (Temin 2002). Our investigation highlights that the wage nexus and labour-capital distribution is indeed very interesting for our understanding of economic growth, but not in the way suggested by the wage restraint literature of the 1990s and early 2000s. We might here note also that the papers on harmful wage increases in the interwar period, so key in forming a malicious counterpart to the allegedly virtuous wage restraint cycle of the postwar period, actually conclude that demand shocks, not wage pushes, were the major factors behind interwar unemployment (Dimsdale, Nickell, and Horsewood 1989; Dimsdale, Horsewood, and van Riel 2006). Thus, while they have made a mark especially as anti-Keynesian arguments, in reality there is a major Keynesian element left in their explanation. Since they did not model this specifically, but rather treated it as temporary shocks, it has not been interpreted as such. But the Keynesian ghost is not out of the machine.

In further work two more aspects should be enjoined with the concern with the distribution-growth connection here. The first is public investment and the public sector generally. This factor in economic growth has varied significantly over time, and for a fuller understanding of the connection between political economy and growth regimes, the public sector should also be included. Surely in highly interventionist economies such as the Scandinavian – and in the postwar period, more or less all capitalist economies – profit rates are not the only consideration relevant for investment decisions, as much of investment is actually either publicly financed, publicly directed, or both. Especially for Norway we have found very low shares of private consumption in GDP, and an internationally high level of public consumption. This means that real growth regimes – not only the private ones considered in this paper – have a more complex layout than we have discussed.

A second aspect that might be interesting in further work is the effect on one country's growth, more specifically exports, of changes in wage shares in its trading partners. As Scott and Spadavecchia (2011) point out in their study of the 1919 eight hour work day reform in Britain, this reform increased hourly wages significantly and so had a negative effect on exports competitiveness, but since most of Britain's trade partners enacted the same reform at the same time, the net effect on British competitiveness was zero or close to zero. This point might be generalizable into other time periods as well, and not the least the post-war period, when wage shares grew in all OECD countries (Bengtsson and Waldenström 2018). But to start with, the present investigation has highlighted that economic historians need to reconsider the role of wages, wage pressure and wage restraint in their analyses of economic performance.

References

Abildgren, Kim (2005), 'Real effective exchange rates and purchasing-powerparity convergence: Empirical evidence for Denmark, 1875–2002', *Scandinavian Economic History Review*, 53 (3), 58-70.

--- (2006), 'Monetary Trends and Business Cycles in Denmark 1875-2005 – New Evidence Using the Framework of Financial Accounts for Organising Historical Financial Statistics', *Danmarks Nationalbank Working Papers* (Copenhagen: Danmarks Nationalbank).

--- (2008), 'Are Labour Market Structures Endogenously Dependent on the Monetary Regime? Empirical Evidence from Denmark 1875–2007', *Danmarks Nationalbank Working Papers 2008:52* (Copenhagen: Danmarks Nationalbank).

--- (2010), 'Quantitative Studies on the Monetary and Financial History of Denmark', (University of Copenhagen).

Akerlof, George A. (1982), 'Labor Contracts as Partial Gift Exchange ', *Quarterly Journal of Economics*, 97 (4), 543-69.

Alexopoulos, Michelle and Jon Cohen (2003), 'Centralised wage bargaining and structural change in Sweden', *European Review of Economic History*, 7, 331-66.

Allen, Robert C. (2009), *The British Industrial Revolution in Global Perspective* (Oxford: Oxford University Press).

--- (2011), 'Why the industrial revolution was British: commerce, induced invention, and the scientific revolution', *Economic History Review*, 64 (2), 357–84.

Banerjee, Anindya, Juan J. Dolado, and Ricardo Mestre (1998), 'Error-correction Mechanism Tests for Cointegration in a Single-equation Framework', *Journal of Time Series Analysis*, 19 (3), 267-83.

Bengtsson, Erik (2015), 'Wage Restraint in Scandinavia: During the Postwar Period or the Neoliberal Age?', *European Review of Economic History*, 19, 359-81.

Bengtsson, Erik and Daniel Waldenström (2018), 'Capital Shares and Income Inequality: Evidence from the Long Run', *Journal of Economic History*, forthcoming.

Bhaduri, Amit and Stephen Marglin (1990), 'Unemployment and the real wage: The economic basis for contesting political ideologies', *Cambridge Journal of Economics*, 14, 375–93.

Bohlin, Jan (2010), 'From appreciation to depreciation – the exchange rate of the Swedish krona, 1913–2008', in Rodney Edvinsson, Tor Jacobson, and Daniel Waldenström (ed.), *Exchange rates, prices, and wages, 1277-2008: Historical monetary and financial statistics for Sweden* (Stockholm: Ekerlids förlag), 340-411.

Bore, Ragnhild Rein and Tor Skoglund (2008), *Fra håndkraft til høyteknologi – norsk industri siden 1829* (Oslo: Statistisk Sentralbyrå).

Broadberry, Stephen N. and Albrecht Ritschl (1995), 'Real Wages, Productivity, and Unemployment in Britain and Germany during the 1920s', *Explorations in Economic History*, 32, 327-49.

Dimsdale, Nicholas, S.J. Nickell, and Nicholas Horsewood (1989), 'Real Wages and Unemployment in Britain during the 1930s', *The Economic Journal,* 99, 271-92.

Dimsdale, Nicholas, Nicholas Horsewood, and Arthur van Riel (2006), 'Unemployment in Interwar Germany: An Analysis of the Labor Market, 1927–1936', *Journal of Economic History,* 66 (3), 778-808.

Edvinsson, Rodney (2005), 'Growth, Accumulation, Crisis: With New Macroeconomic Data for Sweden 1800-2000', Dissertation in Economic History (Stockholm University).

Eichengreen, Barry (1994), 'Institutional prerequisites for economic growth: Europe after World War II', *European Economic Review,* 38, 883-90.

--- (2007), *The European Economy Since 1945: Coordinated Capitalism and Beyond* (Princeton, NJ: Princeton University Press).

Eichengreen, Barry and Torben Iversen (1999), 'Institutions and Economic Performance: Evidence from the Labour Market', *Oxford Review of Economic Policy,* 15 (4), 121-38.

Eichengreen, Barry and Pablo Vazquez (1999), 'Institutions and Economic Growth in Postwar Europe: Evidence and Conjectures', (Berkeley, Calif.: University of California, Berkeley).

Eichengreen, Barry and Albrecht Ritschl (2009), 'Understanding West German economic growth in the 1950s', *Cliometrica,* 3, 191-219.

Eitrheim, Øyvind and Jan T. Klovland (2007), 'Short Term Interest Rates in Norway 1818–2007 ', in Øyvind Eitrheim, Jan T. Klovland, and Jan F. Qvigstad (ed.), *Historical Monetary Statistics for Norway - Part II* (Oslo: Norges Bank), 1–108.

Erixon, Lennart (2008), 'The Swedish third way: an assessment of the performance and validity of the Rehn–Meidner model', *Cambridge Journal of Economics,* 32, 367–93.

Grytten, Ola H. (2004), 'The Gross Domestic Product for Norway 1830–2003', in Øyvind Eitrheim, Jan T. Klovland, and Jan F. Qvigstad (ed.), *Historical Monetary Statistics for Norway 1819–2003* (Oslo: Norges Bank), 241-88.

Harding, Robin (2013), 'Corporate investment: A mysterious divergence', *Financial Times,* 24 July.

Hatton, Timothy and Gerorge Boyer (2005), 'Unemployment and the UK Labour Market before, during and after the Golden Age', *European Review of Economic History,* 9, 35-60.

Hein, Eckhard and Lena Vogel (2008), 'Distribution and growth reconsidered: empirical results for six OECD countries', *Cambridge Journal of Economics,* 32, 479–511.

Hein, Eckhard and Artur Tarassow (2010), 'Distribution, aggregate demand and productivity growth: theory and empirical results for six OECD countries based on a post-Kaleckian model', *Cambridge Journal of Economics,* 34, 727-54.

Johnson, Steve (2013), 'Capital gobbles labour's share, but victory is empty', *Financial Times,* 13 October.

Kaergård, Niels (1991), *Økonomisk vækst: En økonometrisk analyse af Danmark 1870-1981* (Copenhagen: Jurist- og Økonomforbundets Forlag).

Katzenstein, Peter J. (1985), *Small States in World Markets: Industrial Policy in Europe* (Ithaca, NY: Cornell University Press).

Keynes, John Maynard (1936), *The General Theory of Employment, Interest and Money* (London: Macmillan).

King, J.E. (2002), *A History of Post Keynesian Economics since 1936* (Cheltenham: Edward Elgar).

Klovland, Jan T. (2004), 'Historical Exchange Rate Data 1819–2003', in Øyvind Eitrheim, Jan T. Klovland, and Jan F. Qvigstad (ed.), *Historical Monetary Statistics for Norway 1819-2003* (Oslo: Norges Bank), 289-327.

Krantz, Olle and Lennart Schön (2015), 'New Swedish Historical National Accounts since the 16th Century in Constant and Current Prices', *Lund Papers in Economic History* (Lund).

Kumhof, Michael, Romain Rancière, and Pablo Winant (2015), 'Inequality, Leverage, and Crises', *American Economic Review*, 105 (3), 1217-45.

Lavoie, Marc (2009), *Introduction to Post Keynesian Economics* (New York: Palgrave Macmillan).

Lavoie, Marc and Engelbert Stockhammer (2013), 'Introduction', in Marc Lavoie and Engelbert Stockhammer (ed.), *Wage-Led Growth: An Equitable Strategy for Economic Recovery* (London: Palgrave Macmillan), 1-12.

Moene, Karl Ove and Michael Wallerstein (1995), 'How Social Democracy Worked: Labor-Market Institutions', *Politics & Society*, 23 (2), 185-211.

Naastepad, CWM. (2006), 'Technology, Demand and Distribution: A Cumulative Growth Model with an Application to the Dutch Productivity Growth Slowdown', *Cambridge Journal of Economics*, 30 (3), 403–34.

Naastepad, CWM. and S. Storm (2006), 'OECD demand regimes (1960–2000)', *Journal of Post Keynesian Economics*, 29, 213–48.

Nordvik, Helge W. and Ola H. Grytten (1994), 'The labour market, unemployment and economic growth in Norway, 1920–1939', *Scandinavian Economic History Review*, 42 (2), 125-44.

Onaran, Özlem and Giorgos Galanis (2014), 'Income Distribution and Growth: A Global Model', *Environment and Planning*, 46 (10), 2489-513.

Pessoa, Joao Paulo and John Van Reenen (2013), 'The UK Productivity and Jobs Puzzle: Does the Answer Lie in Labour Market Flexibility?', *Centre for Economic Performance Special Paper No. 31* (London: Centre for Economic Performance).

Piketty, Thomas and Gabriel Zucman (2014), 'Capital is Back: Wealth-Income Ratios in Rich Countries 1700-2010', *Quarterly Journal of Economics*, 129 (3), 1255-310.

SCB (1972), *Historisk Statistik för Sverige. Del 3: Utrikeshandel 1732-1970* (Stockholm: National Central Bureau of Statistics).

Scott, Peter and Anna Spadavecchia (2011), 'Did the 48-hour Week Damage Britain's Industrial Competitiveness?', *The Economic History Review,* 64 (4), 1266–88.

Shapiro, Carl and Joseph E. Stiglitz (1984), 'Equilibrium Unemployment as a Worker Discipline Device', *American Economic Review,* 74 (3), 433-44.

SSB (1968), *Historisk Statistikk 1968* (Oslo: Central Bureau of Statistics of Norway).

Stiglitz, Joseph E. and Andrew Weiss (1981), 'Credit Rationing in Markets with Imperfect Information', *American Economic Review,* 71 (3), 393-410.

Stockhammer, Engelbert and Robert Stehrer (2011), 'Goodwin or Kalecki in Demand? Functional Income Distribution and Aggregate Demand in the Short Run', *Review of Radical Political Economics*, 43, 506–22.

Stockhammer, Engelbert, Özlem Onaran, and Stefan Ederer (2009), 'Functional income distribution and aggregate demand in the Euro area', *Cambridge Journal of Economics*, 33, 139–59.

Stockhammer, Engelbert, Joel Rabinovich, and Niall Reddy (2018), 'Distribution, wealth and demand regimes in historical perspective', *FMM Working Paper 14-2018* (Berlin: Macroeconomic Policy Institute).

Storm, Servaas and C.W.M. Naastepad (2013), 'Wage-led or Profit-led Supply: Wages, Productivity and Investment', in Marc Lavoie and Engelbert Stockhammer (ed.), *Wage-led Growth: An Equitable Strategy for Economic Recovery* (London: Palgrave Macmillan), 100-24.

Temin, Peter (1990), 'Socialism and wages in the recovery from the Great Depression in the United States and Germany', *Journal of Economic History,* 50, 297-307.

--- (2002), 'The golden age of European growth reconsidered', *European Review of Economic History*, 3, 3–22.

Waldenström, Daniel (2014), 'Swedish stock and bond returns, 1856–2012', in Rodney Edvinsson, Tor Jacobson, and Daniel Waldenström (ed.), *Historical Monetary and Financial Statistics for Sweden, Volume II: House Prices, Stock Returns, National Accounts, and the Riksbank Balance Sheet, 1620–2012* (Stockholm: Ekerlids förlag), 223-92.

van Zanden, Jan Luiten (2000), 'Post-War European Economic Development as an Out of Equilibrium Growth Path: The Case of the Netherlands', *De Economist,* 148, 539–55.

Vartiainen, Juhana (1998), 'Understanding Swedish Social Democracy: Victims of Success?', *Oxford Review of Economic Policy,* 14 (1), 19-39.

Vonyò, Tomas (2008), 'Post-war reconstruction and the golden age of European growth', *European Review of Economic History,* 12, 221-41.

Wright, Gavin (2006), 'Productivity growth and the American labor market: the 1990s in historical perspective', in Paul Rhode and Gianni Toniolo (ed.), *Understanding the 1990s* (Cambridge: Cambridge University Press), 139-60.

Appendix Table 1. Period averages for our key variables

		Denmark	Norway	Sweden
Wage share	1900-2010	62.9	58.9	66.6
	1945-1973	64.6	61.9	70.5
	1980-	68.3	57.8	69.3
Consumption	1900-2010	61.4	52.6	71.7
	1945-1973	60.8	51.1	73.5
	1980-	49.4	42.0	55.4
Exports	1900-2010	32.1	28.0	34.3
	1945-1973	28.5	22.9	25.0
	1980-	40.9	40.6	64.6
Investment	1900-2010	21.4	23.3	17.8
	1945-1973	25.8	27.3	21.0
	1980-	20.8	21.0	23.5

Note. Sources for X: Kaergård (1991), Statistics Denmark, Grytten (2004), Krantz and Schön (2015). Sources for wage share: Abildgren (2008), Bengtsson and Waldenström (2018). Sources for investment are Abildgren for Denmark, Grytten (2004) for Norway, and Krantz and Schön (2015) for Sweden.

Note: only private consumption included.