Equality and Convergence in the Nordic Societies in the Long Run: Europe and Other Comparative Mirrors

Authors:
Jari Eloranta (Appalachian State University, History, email: elorantaj@appstate.edu)
Jari Ojala (University of Jyväskylä, History, email: jari.ojala@jyu.fi)
Jaakko Pehkonen (University of Jyväskylä, Economics, email: jaakko.k.pehkonen@jyu.fi)
Lars Christian Bruno (BI Norwegian Business School, email: lars.c.bruno@bi.no)

Abstract:
In this paper we analyze Nordic long-run economic performance and wages by focusing on convergence (or divergence) over time among the Nordic countries and whether they converged toward the economic leaders, such as Europe, UK and USA, in particular time periods. Our first comparative mirror was the development of real GDP per capita from the early 19th century to 2010 – it seems that there was a catch-up process in play both among the Nordic economies and in terms of the relationship towards the economic leaders, especially from early 20th century up until the 1970s. Our second comparative mirror was the development of Swedish and Finnish real wages from the 16th to 20th century, and the results suggested very similar development between these two countries, with Sweden having higher standards of living, up until 18th century. Then both countries diverged from the West European “path”, and in particular Finland seemed to stagnate during the 19th century. Our third comparative mirror was formed by a large sample of seamen’s wages in Sweden and Finland from the mid-17th century to the First World War. It appears that divergence was not a uniform phenomenon in the 19th century, since sailors’ wages increased substantially during the so-called first era of economic globalization. It is possible that export-led growth path of the Nordic countries already emerged in the late 19th century, although the impact would not materialize fully until the post-Second World War period.

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1. Introduction

Convergence of wages, prices, and commodities – i.e., globalization – between different parts of the world in different time periods is a popular topic among economists, sociologists, and historians – for example, economic historians have recently become particularly interested in earlier periods of economic integration, like the so-called first era of globalization from the early part of the 19th century to the First World War.¹ For economists and economic historians globalization typically means convergence, meaning a flattening of differences, of prices between two places due to market competition, increased interaction and better economic information, and other types of globalization infrastructure such as banks and monetary instruments. Kevin O’Rourke and Jeffrey Williamson have argued that price convergence, for example between mother countries and their colonies, only started in the 19th century, not during the discovery of the New World or even in earlier cultures and empires. To most economic historians this was the first true “wave” of globalization, rather spectacular by nature, only to be broken apart by the First World War. Another “wave” did not emerge until the post-Second World War period.²

Other scholars like Andre Gunder Frank and many world historians espousing world systems theories have placed the beginning of economic globalization much earlier, perhaps millennia earlier. They claim there have been earlier “waves”, some starting as early as the discovery of the New World in 1492 or the founding of Manila in 1571, or perhaps earlier with the rise and fall of the various empires, the Roman Empire being a typical example.³ Another


issue where historians and development theorists disagree with economists and economic historians is the role played by colonies in the globalization “waves” and the subsequent emergence of the industrial revolutions. Immanuel Wallerstein and dependency scholars have suggested that the decline of the feudal world and the emergence of merchant societies led to the Age of Exploration and the discovery of colonies. For Wallerstein the early European globalization not only ushered in an era of colonialism and global dependencies, but fostered one of the greatest economic changes in history. Many economic historians disagree with this interpretation, especially since the study of industrial revolutions along with the Great Depression in the last 50 years has yielded many new findings. For example, Patrick O’Brien has argued that the trade between the colonies and mother countries was not big enough to have started the British Industrial Revolution.

The rise of the West, or European empires in particular, can also be linked to the relative decline of other world empires and increases in trade. One of the biggest issues in the evaluation of globalization trends is what happened to China from the 15th to the 19th century. The end result is not under debate: China was humiliated in the Opium Wars in the 1840s by British gunboats. The starting point is also not very much open for debate: China was the wealthiest empire in the world in the beginning of the second millennium. However, sometime in mid-millennium China experienced a decline or, respectively, was surpassed by the West, or Britain in particular. Kenneth Pomeranz has maintained that China was quite well off up until the 18th century, and could have potentially entered into the Industrial Age, given enough time and resources. He maintains that the Yangzi Delta region was on par with England during most of this period. Many other economic historians disagree, arguing on the basis of comparisons with wage and price data that England had pulled ahead much earlier. The debate over the economic development, the timing, and the causes of China’s possible decline has become known as the Great Divergence debate. Pomeranz claims that the reason that China did not industrialize was linked to its lack of ready access to coal and other raw materials. Others, like Angus Maddison,

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claim that it was because of the stifling impact of the bureaucratic class, which turned China inwards following 1433, after convincing the new emperor to burn Zheng He’s great fleet. The role of trade, or lack thereafter, seems to be a crucial component in this debate. There is now also considerable new scholarship on developments within Europe, which generally tends to highlight an emerging “Little Divergence”, a reversal of fortunes between Mediterranean Europe and Northern Europe between the 15th and 19th centuries. Most economic historians, however, agree that divergence in its many regional forms occurred prior to the 19th century.

While the focus on global historians is generally on the Great Divergence (and on non-European spheres and their ties to other regions), the Little Divergence is an important research focus as well. However, most of those studies either do not discuss the Nordic polities or do so in a rather cursory manner. In fact, the question we want to investigate is how the Nordic economies compare in these large global processes, namely whether they were part of the Little Divergence or other similar phases. Also, we want to investigate the timing of Nordic development during crucial phases, such as the 19th century globalization and the 20th century economic expansion. Typically Nordic countries are studied because of their rather spectacular economic performance in the 20th century, their remarkable societal trend toward equality, similar historical pasts, the emergence of extensive welfare states, and the currently extremely well-performing educational systems.

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But was there an economic development “path” that they followed? If convergence toward common economic, social, and institutional policies emerged in the late 20th century, does this apply to long-term economic development of the Nordic countries? And how did they fare in comparison with other European nations, including Eastern and Southern European nations? Were the Nordic countries part of the Little Divergence? Here we look at long run macroeconomic data only as we are interested in the convergence (or divergence) of the national economies and wages in Denmark, Finland, Norway, and Sweden. Recent studies, in particular, have analyzed the wages in number of European towns from a period starting from middle ages until our times10, converted the data to real wages11, and compared the long term wage series across different countries.12 This type of data enables us to study economic and societal structures in the very long run.

This paper is part of a larger project to study the Finnish economy in the long run, and the authors are in the process of gathering a lot of long-run data on prices and wages, Nordic studies offer fairly good data on long-run economic growth, i.e. GDP data, as well as newer data on the development of real wages over several centuries.13 Thus, we combine the discussion on wage convergence and dispersion by, first, analyzing whether the Nordic countries themselves experienced economic convergence in the 19th and 20th centuries (=first comparative mirror); then, by examining the long-run real wage data for Sweden and Finland in various European comparisons, to see how these two Nordic economies fared compared to the leading European economies and some of the smaller ones, and also exploring a possible East-West or North-South dichotomy (=second comparative mirror); and finally, by analyzing the development wages of


Swedish and Finnish seamen in various occupation categories in comparison with other unskilled and skilled European laborers, which also reflects landward opportunities at home and abroad, and by investigating the dispersion of wages within the Nordic shipping industry (=third comparative mirror).

Our results indicate that Nordic countries did experience an economic catch-up process, but mostly in the 20th century. Moreover, it seems that Swedish and Finnish real wages developed fairly similarly from the 16th to the 20th centuries, although Sweden experienced higher economic growth rates in the 18th and 19th centuries. Both countries, but especially Finland, diverged from the West European economic development in the 18th and 19th centuries. Therefore, at least Finland did not initially participate in the Little Divergence. However, in the 20th century the Nordic economies converged on the leading world economies. Furthermore, based on a large sample of seamen’s wages, not all sectors of the Nordic economies diverged from the 19th century European expansion, driven by globalization. The wages of Nordic sailors rose dramatically in the 19th century, even exceeding the landward opportunities in many major European cities. However, at the end of the century those opportunities were no longer as exceptional. In general, though, opportunities emerging in foreign trade may have preceded the export-led growth of the Nordic economies in the 20th century.

2. Globalization, Convergence, and the Nordic Economies: A structural perspective

There is no denying the transformative power of the current “wave” of globalization that started 30 or so years ago; it most certainly has changed the dynamics of world politics and economics, although scholars disagree about the timing of the beginning of that event. This debate has even permeated popular public discourse – for example, Thomas Friedman, an author and New York Times columnist, calls the very latest phase in that modern globalization, which he identifies as having started around year 2000 as something quite dramatically new and changing with increasing velocity: “Globalization 3.0 is shrinking the world from a size small to a size tiny and flattening the playing field at the same time.”

Typically scholars imply certain interpretations, such as increasing connectedness between countries and regions, interaction beyond national borders, the spreading of ideas and technology at an ever faster pace, and movement of people over borders and natural boundaries. Precise definitions are much harder to find or formulate due to the different methodological emphases among scholars. Implying some sort of correlation or causal outcome as the end result, globalization is often analyzed in conjunction with other important phenomena like conflicts, spread of democracy, trade treaties and other institutions, economic development, the decline of national identities and cultures, and the growing importance of multinational corporations and other supranational organizations. Here we are particularly interested in the globalization waves prior to the 20th century, especially the convergence and divergence patterns in the last 500 years and their implications for the Nordic economies.

In order to start examining the performance and development of the Nordic economies, we want to place them in various comparative mirrors. First, we wish to utilize the real GDP per capita data for these nations. In general, in the early modern era Nordic economies fell behind Great Britain (and also the emerging United States). The catch-up process for the Nordic countries began mostly in the 20th century, especially after World War I. In the post-World War II period, the British economy slowed and has converged on the Nordic GDP per capita levels. Unfortunately, we do not yet have very detailed information on all of these economies, since for example the Finnish historical national accounts only go as far back as 1860. The most meaningful way to form longer economic time series, short of reconstructing national accounts and/or estimating them backwards is to utilize real wages. Here we want to use a large source of data to assess structural qualities of Nordic labor markets and wages in the long run. However, we first wanted to examine Swedish and Finnish economic development in comparison with the economic leaders of the 19th and 20th centuries, respectively the UK and the USA (see Figure 1). It seems that Sweden and Finland were rather consistently behind the leading economies,

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although they were able to keep pace with those economies for most of the period, even prior to the 19th century. And some significant catching up occurred in late 20th century, as they caught up to the UK, for example.

Figure 1. Swedish and Finnish Real GDP per Capita in the Long-run Comparisons with the UK and USA


We next plotted the real GDP per capita for all the Nordic countries during the 19th and 20th centuries. In general, the economic development of the Nordic countries has been fairly uniform, especially in the 20th century, as seen in Figure 2. Denmark was clearly above the rest until the 1930s when the others started to catch up. Norway took the lead in the 1980s, and the rest converged toward similar levels of development by the end of the 20th century, although the economic recession of the 1990s affected them in different ways. The story, however, seems to be one of convergence in the long run.
What about convergence and divergence between the Nordic countries themselves and in terms of their relationships to the economic leader nations? As seen in Figure 3, there was a lot of divergence among the Nordic economies until the beginning of the 20th century. The coefficient of variation, which is one way to measure so-called sigma (σ) convergence along with standard deviation (measuring dispersion in the real GDP per capita levels over time), declined sharply after that almost continuously until the 1980s and 1990s, when there was a temporary increase in the value. On average, the Nordic economies have experienced steady and accelerating economic expansion from the early 20th century onward. While Denmark was the early leader, in the 20th century Sweden and especially Norway have surpassed it.
Figure 3. Nordic Economic Performance and Convergence, 1800-2010

Source: see previous figure. CV = coefficient of variation.

Nordic economies have certainly fared much better than the world, on average (see Figure 4). However, when compared with the leading economy of the 19th century (UK) and the leading economy of the 20th century (USA), the picture gets a bit murkier. Nordic economies starting to, slowly and in fits, catch up to the UK from the early 20th century onwards, reaching parity in the late 1960s and maintaining a dwindling edge until the early 21st century. As for the USA, the Nordic economies steadily lost ground in the 19th century until the 1920s, when they temporarily gained some ground, only to lose it again during the Second World War. In the post-war period, however, they have experienced some catching up, although never gaining (on average) parity.
Along with σ-convergence, a typical way to examine convergence between economies is to see if beta (β) convergence occurs, implying that poorer countries develop faster than rich ones, i.e. they catch up over time.\(^\text{16}\) Here we measure β-convergence in the following fashion:

\[
\Delta y_{it} = \alpha + \beta(y_{i,t-1}) + \mu_{i,t}, \tag{1}
\]

where delta \(y_{it}\) represents the annualized growth of real GDP per capita for the given country (Denmark, Finland, Norway, and Sweden) in the panel in logs; \(\alpha\) is the common constant; beta is expressed as the previous years’ growth rate in logs for the given country; and the \(\mu\) is the error term. Usually this type of β-convergence is called absolute convergence, since it does not take into account other possible factors, in comparison with conditional convergence. Here we do not

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examine conditional convergence in the typical way (i.e., by including regional dummies and/or sectoral shares in the regressions), due to lack of data mainly, but in addition we estimated a variation of this equation.\footnote{See e.g. Kangasharju, Aki. 1998. "Beta Convergence in Finland: Regional Differences in Speed of Convergence." \textit{Applied Economics}, 30(5), 679-87. Lall, Somik V and Serdar Yilmaz. 2001. "Regional Economic Convergence: Do Policy Instruments Make a Difference?" \textit{The annals of regional science}, 35(1), 153-66.}

This analysis represents a catching-up process that unfolds as weaker countries imitate the technological and managerial frontier of the leader. The ability of any country to do this depends on the gap between the country and the leader. The gap, in terms of per capita income, may be written in logs:

\[ y_t - y_{t-1} = \alpha' + \beta'(y^*_{t-1} - y_{t-1}), \]

(2)

where \( y \) is the log level of real income per capita of the follower country, and \( y^* \) is the log level of real income per capita of the leader country, \( \alpha' \) is the exogenously given growth rate of the leader and \( \beta' \), the catch-up parameter lies in the interval \((0,1)\). Defining the gap as \( z_t = y^*_{t} - y_t \), (2) can be rewritten as:

\[ z_t = (1-\beta') z_{t-1} \]

(3)

The model has only one steady state solution, namely when \( z=0 \) and full catching up has occurred. This follows from the implicit assumption that the only factor driving growth is the gap. The potential role of other infrastructural variables - human and physical capital and research and development expenditure, for example - is largely ignored. In this paper, due to lack of data as noted above, we simply augment equation (1) by the gap variable and estimate:

\[ \Delta y_{it} = \alpha + \beta(y_{i,t-1}) + \beta'(z_{t-1}) + \mu_{i,t}, \]

(4)

which, as before, assume that poorer countries develop faster than rich ones, and the growth rate of the follower country depends of its position with respect to the leader country.

Most studies have found evidence for \( \beta \)-convergence, but usually the data used has been for the post-Second World War period. As in the classic studies by Robert Barro and others, it
has been suggested that the catch-up usually occurred at the rate of 2 per cent per year.\textsuperscript{18} Studies of Nordic convergence (or divergence) are rather rare. There are some that have investigated for example regional convergence, as in the case of Finland in the 20\textsuperscript{th} century.\textsuperscript{19} Aki Kangasharju confirmed the 2 per cent long run convergence rate, but also noted that in the short run convergence tended to be quite unstable.\textsuperscript{20}

Typically these types of studies use fixed 30- and/or 60-year periods in their testing. Here, however, we wanted to avoid possible time series distortions due to unit roots and structural breaks. First of all, all of the series, based on both individual country and panel standard ADF-tests (and no cointegration vectors were found using the various individual series and panel tests) were found to be I(1). We then performed the Bai-Perron test to see how many potential structural breaks the series had. For most of them there was a break in the 1860s, for some during the First World War, for all after the Second World War and during the mid-1970s. Next we performed the Perron-test, which allows for one structural break and unit root to occur, apparently all the series most likely had both, indicates that the world wars formed major breaks in the series. Based on these tests, we divided up the sub-periods for our convergence analyses accordingly: 1820-1865, 1866-1913, 1914-1946, 1947-1974, and 1975-2010.\textsuperscript{21} Table 1 provides an overview of the statistical characteristics of the growth variables, both for the entire period and for the chose sub-periods.\textsuperscript{22}

\begin{thebibliography}{9}
\bibitem{Results} Results of all of the statistical tests are available from the authors by request.
\end{thebibliography}
<table>
<thead>
<tr>
<th>Period</th>
<th>Denmark</th>
<th>Finland</th>
<th>Norway</th>
<th>Sweden</th>
</tr>
</thead>
<tbody>
<tr>
<td>1820-2010</td>
<td>Mean:6,941</td>
<td>Mean:6,313</td>
<td>Mean:6,543</td>
<td>Mean:5,749</td>
</tr>
<tr>
<td></td>
<td>Median:3,826</td>
<td>Median:2,988</td>
<td>Median:2,615</td>
<td>Median:2,258</td>
</tr>
<tr>
<td></td>
<td>Std. Dev.:6859</td>
<td>Std. Dev.:6,641</td>
<td>Std. Dev.:7,774</td>
<td>Std. Dev.:6,642</td>
</tr>
<tr>
<td></td>
<td>Min.:1,274</td>
<td>Min.:781</td>
<td>Min.:767</td>
<td>Min.:766</td>
</tr>
<tr>
<td></td>
<td>Max.:25,060</td>
<td>Max.:24,694</td>
<td>Max.:28,556</td>
<td>Max.:25,377</td>
</tr>
</tbody>
</table>

| 1820-1865  | Mean:1,526     | Mean:923       | Mean:987      | Mean:1,017    |
|            | Median:1,452   | Median:955     | Median:956    | Median:979    |
|            | Std. Dev.:193  | Std. Dev.:62.9 | Std. Dev.:132 | Std. Dev.:97.8|
|            | Min.:1,274     | Min.:781       | Min.:767      | Min.:888      |
|            | Max.:1,875     | Max.:969       | Max.:1,293    | Max.:1,225    |
|            | N:46           | N:8            | N:37          | N:46          |

| 1866-1913  | Mean:2,648     | Mean:1,421     | Mean:1,716    | Mean:1,808    |
|            | Median:2,462   | Median:1,315   | Median:1,692  | Median:1,617  |
|            | Min.:1,840     | Min.:886       | Min.:1,304    | Min.:1,113    |
|            | Max.:3,912     | Max.:2,111     | Max.:2,447    | Max.:2,874    |

| 1914-1946  | Mean:4,791     | Mean:2,666     | Mean:3,319    | Mean:3,988    |
|            | Median:4,785   | Median:2,666   | Median:3,387  | Median:4,033  |
|            | Std. Dev.:712  | Std. Dev.:694  | Std. Dev.:670 | Std. Dev.:844 |
|            | Min.:3,459     | Min.:3,717     | Min.:2,434    | Min.:2,782    |
|            | Max.:5,993     | Max.:3,697     | Max.:4,441    | Max.:5,646    |
|            | N:33           | N:33           | N:33          | N:33          |

| 1947-1974  | Mean:9,522     | Mean:6,744     | Mean:7,761    | Mean:9,422    |
|            | Median:9,062   | Median:6,444   | Median:7,400  | Median:8,913  |
|            | Std. Dev.:2,555| Std. Dev.:2,249| Std. Dev.:2,035| Std. Dev.:2,456|
|            | Min.:6,035     | Min.:3,717     | Min.:4,864    | Min.:6,091    |
|            | Max.:13,945    | Max.:11,361    | Max.:11,726   | Max.:13,885   |

| 1975-2010  | Mean:19,548    | Mean:17,046    | Mean:20,698   | Mean:18,527   |
|            | Median:18,910  | Median:16,033  | Median:19,719 | Median:17,400 |
|            | Std. Dev.:3,519| Std. Dev.:4,054| Std. Dev.:5,208| Std. Dev.:3,614|
|            | Min.:13,621    | Min.:11,355    | Min.:12,271   | Min.:14,004   |
|            | Max.:25,060    | Max.:24,694    | Max.:28,556   | Max.:25,377   |
|            | N:36           | N:36           | N:36          | N:36          |


Note! Finnish series has annual values only from 1860 onwards, Norway from 1830 onwards. Both have some spot estimates before those years, however. For Denmark and Sweden we have full series for the entire period.

Table 2. Beta Convergence for Nordic Economies, 1820-2010

<table>
<thead>
<tr>
<th>Period</th>
<th>Specification 1 (only β)</th>
<th>Specification 2 (β, and Convergence with UK or USA)</th>
<th>UK</th>
<th>USA</th>
<th>Adj. R²</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>β-coefficient</td>
<td>Adj. R²</td>
<td>β-coefficient</td>
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<td></td>
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<tr>
<td>1820-1865</td>
<td>0.04</td>
<td>0.00</td>
<td>-0.76**</td>
<td>1.05***</td>
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</tr>
<tr>
<td>1866-1913</td>
<td>0.09</td>
<td>0.00</td>
<td>0.09</td>
<td>0.16**</td>
<td>-</td>
</tr>
<tr>
<td>1914-1946</td>
<td>-0.34***</td>
<td>0.05</td>
<td>-0.29*</td>
<td>-</td>
<td>0.08</td>
</tr>
<tr>
<td>1947-1974</td>
<td>-0.14**</td>
<td>0.03</td>
<td>-0.07</td>
<td>-</td>
<td>0.11*</td>
</tr>
<tr>
<td>1975-2010</td>
<td>-0.21***</td>
<td>0.14</td>
<td>-0.26***</td>
<td>-</td>
<td>0.15***</td>
</tr>
</tbody>
</table>

Sources: see previous figures. The dependent variable is the annualized GDP per capita growth rate in logs. The beta convergence variable is explained in the text. UK refers to the difference between UK’s real GDP per capita and the particular Nordic country’s real GDP per capita in the panel (t-1). USA refers difference between USA’s real GDP per capita and the particular Nordic country’s real GDP per capita in the panel (t-1). Method: pooled EGLS (Estimated Generalized Least Squares). We tested the equations with three different frameworks: 1. Cross-section weights and cross-section PCSE standard errors and covariances, with fixed effects; 2. Period weights and period PCSE standard errors and covariances; 3. Period weights and period PCSE standard errors and covariances, with individual intercepts for the countries. We utilized the framework in which the β-coefficient was statistically most significant or the one with the highest adjusted R² in the table. An intercept was used in each estimation, but the values are not reported here.

Here we found that β-convergence was not a consistent feature in the period. It seemed to apply mostly in the 20th century among the Nordic countries, as seen in Specification 1. Nordic countries exhibited this late convergence with rather large coefficients, implying (Specification 1) a 21-34 per cent growth impact, although the results are rather imprecise and unstable. Moreover, when we look at Specification 2, the catch up impact seems to have applied in most of the period. The impact of UK as a leader was more sizable and statistically significant than that of the USA, although the role of the USA became more pronounced towards the end of the period. Overall, the bigger the previous years’ gap with the leading economy, the bigger the annualized Nordic growth rate, implying catch-up behavior. In general, the adjusted R-squared values were small, and it is likely that the various shocks had an impact on the β-coefficients. Our next step is to introduce shocks (various dummies e.g. for war periods, agriculture’s share of the economy etc.) to the estimation in order to improve the accuracy.
### Table 3. Determinants of Sigma Convergence for Nordic Countries, 1820-2010

<table>
<thead>
<tr>
<th>Period</th>
<th>β-coefficient</th>
<th>Adj. R²</th>
<th>Specification 2 (β, and Convergence with UK or USA)</th>
<th>UK</th>
<th>USA</th>
<th>Adj. R²</th>
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<tbody>
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<td></td>
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<td>Period</td>
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<tr>
<td>1820-1865</td>
<td>0.35***</td>
<td>0.67</td>
<td>0.20**</td>
<td>0.19***</td>
<td>-</td>
<td>0.87</td>
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<tr>
<td>1866-1913</td>
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<td>0.79</td>
<td>0.18***</td>
<td>0.16***</td>
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<td>1975-2010</td>
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<td></td>
<td>0.03**</td>
<td>0.07</td>
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</table>

**Sources:** see previous figures. The dependent variable is the coefficient of variation for the Nordic countries’ GDP per capita levels in logs. The beta convergence variable is the same as in the previous table. Everything else is the same as explained in Table 1.

Beta convergence is usually highlighted as a necessary pre-condition for the sigma convergence, which is what we test for in Table 3 (and in Figure 3). Moreover, we tested again the impact of the UK and the USA on the Nordic convergence.

\[
\sigma_t = \alpha + \beta(y_{i,t-1}) + \mu_{i,t}
\]  

(5)

where the dependent variable is the coefficient of variation for the Nordic countries’ real GDP per capita levels in logs. The rest of the variables are the same as explained before. Based on the estimations, it seems that β-convergence explained the σ-convergence quite well. However, the coefficients were positive for three out of the five sub-periods, so the results are not entirely straightforward to interpret. Convergence occurred in the period from the First World War to the Oil Crises, and divergence during the other period. The Nordic countries were also responsive to the gap with the leading economy. An increase in the gap with the UK also increased the coefficient of variation in the 19\textsuperscript{th} century; however, the period 1914-1974 stands out again, since this the period when the Nordic countries were catching up to the USA. Finally, it is also notable that the explanatory value of the framework declines dramatically during the last sub-
period, possibly, again, due to various shocks. In general, we can confirm the existence of β-convergence as a force that tended to reinforce σ-convergence.

3. Nordic Wages in Long Run European Wage Mirrors

The limitations of the real GDP data are rather obvious, namely that they become scarce toward the early 19th century (or beyond). Even though there are now efforts underway in the various Nordic countries, it is still difficult to obtain real GDP per capita figures for the period prior to 1800, with Sweden being one of the few exceptions. The new series are now available going all the way to the beginning of the 16th century.23 Given these problems, here we wish to analyze the development of the Finnish and Swedish economies in the long run through real wages.24 Real wages themselves are not without problems. In particular, they are an imperfect proxy for real GDP per capita.25 Nonetheless, they do tell us about broad trends in development over time.

What do the data tell us? For example, Sweden’s long run development, as depicted in Figure 5, seems quite similar to most European cities, with the exception of London that is clearly ahead of the rest. Sweden in fact looks rather like Paris rather than Krakow. In a sense, Sweden is clearly following a West European development path in the longue duree.

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When we add Finland to the mix (Figure 6), the situation becomes more muddle. Clearly there is no uniform Nordic development path for the entire period. In particular, a divergence emerged between Finland and Sweden starting in the 18th century, and this gap widened in the 19th century. Moreover, Finland’s development is more in line with Eastern European cities like Krakow, in essence putting Finland in a different category than Sweden prior to the 20th century. Of course, both Poland and Finland were part of the Russian Empire in the 19th century, and subjected to similar institutional and economic constraints, so this is not entirely surprising.26

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Figure 6. Swedish and Finnish Real Wages in the Long Run, in Comparative Mirrors, 1365-1914

Sources: see previous figures. Please note that the Finnish series starts in 1541.

Figure 7 shows this even more clearly: In the 18th and 19th centuries, Finland followed the Eastern European development path. For example, the real wages in Leipzig in the 19th century were substantially higher than in Finland, which was not true a century earlier.

What about Southern Europe? How do Sweden and Finland compare to the Mediterranean economies? This particularly relevant for the discussion of the Little Divergence, i.e. did the Nordic economies stagnate in a similar fashion as the Mediterranean economies did. We see some of those patterns in Figure 8. Both Milan and Madrid were likely substantially ahead of Finland until mid-18th century; after that, they develop relatively similarly over the 19th century.
Figure 7. Finnish Long-run Real Wages in Comparison with Eastern Europe

Sources: see previous figures. Please note that the Finnish series starts in 1541.

In essence, a European periphery emerges in the 18th and 19th centuries compared to the industrializing West European nations. However, the timing of the Nordic divergence was completely different: Whereas the Mediterranean economies lost ground to Western Europe since the 15th century, the Nordic economies actually kept pace with the West, at least until the 18th century. Then the later timing of the industrialization most likely caused them to diverge from the West European path and join the periphery, at least until the mid-20th century. Of course, Finland diverged from the Swedish economic development path too, so there were differences among the Nordic countries too.
Figure 8. Finnish Real Wages in Comparison with Milan and Madrid, 1541-1914

As seen in Table 4, we can see how the development paths of Sweden and Finland diverged up until the 20th century. While both stagnated in the 18th century, the Swedish real wages rose much faster than the Finnish wages. Moreover, Finnish real wages were not substantially different from the Russian wages in the 18th century. We do, however, start to see a change in the
19th century, when the Finnish wages start to increase faster than the Russian (in Urals) wages. By 1871, it is apparent though that Finland somewhat stagnated in the 19th century in comparison with both Sweden and Russia, or at least parts of Russia.

Figure 9. Difference between Swedish and Certain European Cities’ Real Wages, 1365-1914

Sources: see previous figures for details. Calculated as the difference between the European city and Sweden’s (or Finland’s) real daily silver wage.

Was Sweden, then, part of the “West” and Finland part of the “East” in terms of long-term economic development prior to the 20th century economic miracle. In the long run, Swedish real wages maintained parity with wages in Leipzig and Krakow, at least until the end of the 18th century (see Figure 9). After that, Swedish real wages rose in comparison with those cities, and clearly surpassed from mid-19th century onwards. Moreover, the gap with Paris was relatively small until early 19th century; after that, Paris clearly developed faster, especially towards the late 19th century. Wages in London developed faster throughout the period, and the gap widened even faster in the 19th century. In particular, the globalization of the latter part of the century

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accelerated that process. However, in all cases the gap started close, or was eliminated entirely in the last two decades before the First World War.

**Figure 10. Difference between Finnish and Certain European Cities’ Real Wages, 1541-1900**

Respectively, the Finnish real wages developed in a similar fashion as the Swedish ones until the late 18th century, as we can observe in Figure 10. From there on, the Swedish wages grew a lot faster, and the Finnish real wages were closer to for example Polish real wages. In all comparisons the gap increased in the late 19th century, as Finland was slower to industrialize. Furthermore, we also performed the Bai-Perron breakpoint tests on the time series formed from the gap between the real wage in London and the Swedish (or Finnish) real wage for the uniform period of 1541-1900. It seems that the relationship of the Swedish wage to thriving London was, as the previous graphs attest to, more prone to structural breaks in the earlier part of this period. For Sweden, the structural break years were 1601, 1656, and 1798. Moreover, given that the ADF-test did not reveal any unit roots, the results are fairly robust. For Finland, the breaks occurred slightly later, in 1640, 1793, and in 1847. While the Finnish series most likely had a

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28 The results are available from the authors by request.

23
unit root too and the results are less robust, it seems that Finland’s relationship to the fastest
growing economy was indeed one of strong decline. Clearly there were at least two Nordic
economic divergence and convergence paths, one in the West (Sweden) and one in the East
(Finland). But was this representative of all economic sectors? It is rather well-established that
both countries industrialized late, Finland being even slower in this process. 29 Next we will
examine the real wages in an international industry, shipping, to see whether the differences
between these two economies and Europe as a whole still hold.

4. Seamen’s Wages in the Nordic Countries in the Age of Globalization

Did convergence happen in the 19th century? Previous results here suggest that most of that
happened in the 20th century and possibly even prior to the 19th century. Was the 19th century a
period of divergence in every sense? Did wages in all occupations diverge from leading
European economies? When did convergence start when look beyond the macro-level aggregate
data? Here we wish to provide yet another comparative mirror by examining the real wages of
Swedish and Finnish sailors from the 18th to the 20th century.

In fact, maritime wages are especially interesting as one could assume a certain amount
of convergence in wages across the countries in international shipping. Thus, previous historical
studies on maritime wages have analyzed possible wage convergence during the first era of
globalization. 30 However, number of studies has shown that this kind of convergence did not
exist, which, in turn, shows up for example in desertions of Nordic sailors who were on a quest
for better pay in foreign port towns. 31 Indeed, previous studies have shown that the seamen’s

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wages were considerably higher on British, German, and North American ships than on the
Nordic ones.  

Here we focus on the Seamen’s House data that begins in the 1750s and covers the period
up to the 1950s, and it includes circa 650,000 hiring cases from Sweden and Finland. The data is
compiled from the Swedish National Archives’ project “Arkion” that combined a database from
nine Swedish and one Finnish Seamen Houses from the period in question. These enrollments of
individual sailors offer information such as name, date and place of birth, age, marital status,
salary, occupation on board, date of hire and return, specifications about the ship the man was
hired to work on (name, tonnage, type, captain), and the likely destination of the ship and
information about the voyage, including possible deaths, sicknesses, and desertions.

Thus, we are also able to analyze possible wage convergence between the Nordic
countries and other European countries from this large sample, for a particular sector of the
economy. In this case, we have only included data from some of the most important destination
towns. The salaries paid to (un)skilled workers at home enables us to analyze in more detail the
landward opportunities and possible converging or diverging patterns of wages. The comparable
data is derived from existing literature. The seamen’s wages were made comparable by deflating
all values into silver units (grams) by following the standard procedures in the current
literature. Furthermore, real wages were calculated by using applicable consumer and cost of
living indices. The monetary units used in Sweden and Finland are especially challenging as in

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certain periods of time even three to four different currencies were used at the same time, all with different exchange rates.\textsuperscript{35}

In order to analyze the convergence (or divergence) of wages paid for landward and maritime occupations, we first compared the Finnish data on unskilled workers with the Finnish seamen’s wages derived from the dataset. (Table 5) This late 19\textsuperscript{th} century data includes able-bodied (AB) and ordinary sailors (OS) wage data from one Finnish town in data (Kokkola) and wages of urban unskilled outdoor and manufacturing workers in Finland.\textsuperscript{36} The opening of opportunities on land in Finland from the late 19\textsuperscript{th} century onwards offered new possibilities for unskilled workers, as well as for sailors. Furthermore, the bulk of these new domestic opportunities opened up for unskilled workers capable of using their “brawn”\textsuperscript{37} – thus, for men just like ordinary seamen.\textsuperscript{38} The analysis suggests (Table 5) that the landward wages first converged with the maritime wages, and from the turn of the century there was a diverging pattern within the wages. Especially the AB wages outperformed urban wages up to the 1880s. There seems to have been a decline in the AB wages at the turn of the century. As regards to the OS wages, the development was even more dramatic, especially in relation to the manufacturing workers. Here, however, one must note that the OS wages in the case of Kokkola might have


\textsuperscript{36} From Finns hired to British vessels in late 19\textsuperscript{th} century around 75 per cent were literate, whilst the share of the Swedes was 87 per cent according to the Canadian database.

been under the mean from the late 1880s onwards, when the deep sea shipping in the town practically ceased to exist.\textsuperscript{39}

Table 5. Kokkola AB and OS Wages in Proportion to Finnish Urban Unskilled Outdoor and Manufacturing Workers, 1864–1914

<table>
<thead>
<tr>
<th>Year</th>
<th>AB/Urban Unskilled Outdoor</th>
<th>OS/Urban Unskilled Outdoor</th>
<th>AB/Manufacturing Workers</th>
<th>OS/Manufacturing Workers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1860</td>
<td>1.40</td>
<td>0.74</td>
<td>1.51</td>
<td>0.80</td>
</tr>
<tr>
<td>1870</td>
<td>1.08</td>
<td>0.57</td>
<td>1.23</td>
<td>0.65</td>
</tr>
<tr>
<td>1880</td>
<td>0.88</td>
<td>0.52</td>
<td>0.82</td>
<td>0.48</td>
</tr>
<tr>
<td>1890</td>
<td>0.97</td>
<td>0.57</td>
<td>0.82</td>
<td>0.48</td>
</tr>
<tr>
<td>1900-09</td>
<td>0.64</td>
<td>0.47</td>
<td>0.63</td>
<td>0.46</td>
</tr>
<tr>
<td>1860-1913</td>
<td>0.85</td>
<td>0.52</td>
<td>0.84</td>
<td>0.50</td>
</tr>
</tbody>
</table>

Sources: The data on nominal wages of urban unskilled outdoor and manufacturing workers is derived from (Sakari Heikkinen, 1997a).

Figure 11. Nominal Daily Wages of All Seamen in the Dataset and Daily Wages in Stockholm (in Grams of Silver), 1753–1913

Sources: Arkion database and Söderberg (2011).

Same conclusions can also be drawn when analyzing the larger dataset with five Swedish towns, and comparing this data to the wages of Stockholm laborers. (Figure 11) Wages stagnated in the 18th century, by and large. Seamen’s wages were substantially higher, both in Finland and Sweden as the labor market was highly mobile during the expansion period, from 1840s to the 1860s. After that, they seem to have followed a slower pattern of growth, for instance compared to Swedish silver wages as a whole. Thus, the wages paid in Stockholm and the seamen’s wages were converging from the mid-18th century up to the late 1840s. Thereafter the wages diverged due to the better maritime wages until the 1870s. From the early 1890s onwards, the nominal daily wages in Stockholm clearly outperformed the wages paid to sailors. This comparison, though, is partly misleading, since the maritime wages of skilled occupations (like mates) are also included in the dataset.

The domestic landward and maritime wage convergence does not explain all the opportunities the sailors had during the period we analyzed. The sailors could be hired for some domestic (un)-skilled work, but also abroad as shipping was, indeed, international business. Though being hired by a foreign ship in a foreign port was restricted by the law up to the late 19th century, these opportunities were widely used. This can be witnessed in the desertions of Nordic sailors which occurred rather frequently in foreign ports. Besides being enrolled on foreign ships, the sailors also deserted to exploit other landward opportunities: especially in the North American ports, desertions were a way to emigrate.40

According to previous studies, seamen’s wages were considerably higher in the UK, Germany, the United States, and also in Canada than in the Nordic countries.41 In the contemporary debate in the mid-nineteenth century it was often argued that Nordic sailors could earn ten times their domestic pay abroad.42 Our data suggest, though, that this difference was

perhaps not as large as claimed. Table 6 shows that in Liverpool and London mean wages were higher than in two port towns in the dataset, namely Gävle from Sweden and Kokkola from Finland. Wages clearly increased in the British port towns, but not as rapidly in Sweden and not at all in Finland. Still, though, there was a clear divergence in the maritime wages paid in the UK and Nordic countries, according to this analysis, during the turn of the 20th century.

Table 6. Mean Wages of Able-bodied (AB) Seamen in London, Liverpool, Kokkola, and Gävle, (Pounds Sterling per Month), 1863–1913

<table>
<thead>
<tr>
<th>Period</th>
<th>London</th>
<th>N</th>
<th>Liverpool</th>
<th>N</th>
<th>Kokkola</th>
<th>N</th>
<th>Gävle</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>1860s</td>
<td>2.5</td>
<td>449</td>
<td>2.4</td>
<td>636</td>
<td>2.0</td>
<td>170</td>
<td>2.0</td>
<td>279</td>
</tr>
<tr>
<td>1870s</td>
<td>2.8</td>
<td>725</td>
<td>2.9</td>
<td>1397</td>
<td>2.2</td>
<td>305</td>
<td>2.5</td>
<td>2792</td>
</tr>
<tr>
<td>1880s</td>
<td>2.8</td>
<td>643</td>
<td>2.9</td>
<td>2186</td>
<td>1.8</td>
<td>324</td>
<td>2.4</td>
<td>2647</td>
</tr>
<tr>
<td>1890s</td>
<td>3.4</td>
<td>364</td>
<td>3.3</td>
<td>1025</td>
<td>2.1</td>
<td>251</td>
<td>2.5</td>
<td>1594</td>
</tr>
<tr>
<td>1900-1909</td>
<td>4.0</td>
<td>208</td>
<td>3.4</td>
<td>737</td>
<td>1.9</td>
<td>50</td>
<td>2.9</td>
<td>425</td>
</tr>
<tr>
<td>1863-1913</td>
<td>3.2</td>
<td>2516</td>
<td>3.1</td>
<td>6148</td>
<td>2.0</td>
<td>1118</td>
<td>2.5</td>
<td>7737</td>
</tr>
</tbody>
</table>

Sources: Arkion sjömanhus –database; Ships and Seafarers of Atlantic Canada – database; Seamen’s House Registers of Kokkola at the Vasa Provincial Archives, Finland. See also (Jari Ojala, Jaakko Pehkonen and Jari Eloranta, 2013).

Notes: All wages are in nominal values. Only wages paid on a monthly basis are taken into account in all cases. For London, Liverpool, and New York, moreover, only wages paid in pounds were calculated and obvious outliers deducted (wages over 10 and under one pound per month). Wages for Kokkola and Gävle were included only from 1864 onwards. Only wages paid in markkas (Finland) and kronas (Sweden) were included.

Interestingly, our data suggests that the Nordic ordinary sailors got better pay in real wage values when compared to labourers in major European port towns Amsterdam and London. (Figure 12) Thus, on one hand the Nordic seamen wages were lagging behind the central European economies as suggested in Table 4, but were still competitive to landward opportunities both at home (Figure 11) and abroad (Figure 12) until the end of the 19th century. Swedish ordinary sailors wages converged with the London and Amsterdam wages in the late 18th century – with the exception of few years, presumably caused by the Napoleonic wars. The seamen wages diverged from the late 1820s, and converged, again, from the 1890s onwards.
Figure 12. Daily Real Wages: Swedish/Finnish Ordinary Sailors (OS) and Labourers in London and Amsterdam, 1753-1913

Sources: see previous figures.

Figure 13. Daily Real Wages: Swedish/Finnish Ordinary Sailors (OS) and Labourers in London and Amsterdam, 1753-1913
As seen in Figure 13, Swedish and Finnish seamen made, comparatively, a lot of money in the mid-19th century, also in the category of more educated/experienced workers, like craftsmen and ship’s supervisors. Those wages dropped, respectively, after the globalization boom in the late 19th century. After that, they converge with the leading European cities, at least temporarily.

This period also featured two distinct phases between the occupational groups on Nordic ships. First, the distribution of the seamen’s wages either remained the same or converged until 1830s. After that, there was a strong tendency towards divergence, i.e. the higher occupations benefitted from the globalization boom and the shift towards steam power on ships. Thus, we see skill-biased technological growth in the classical sense during this period. In the interwar period, there is much more volatility, as one would expect. Also, the divergence trend seems to come to an end at this time. These results are preliminary, though, as the conversion to real wages, for example, might have an effect to analysis. All in all, though, we can conclude that it did pay, indeed, to be hired on a Nordic ship – especially during the period from the 1830s up to the
1880s. Moreover, not all Nordic economic sectors diverged from the European economic growth path of the 19th century – in an international sector like shipping the Nordic labor did very well indeed.

5. Conclusions and Further Challenges

This paper forms a part of a larger project to study Finnish economy in the long run. Here in this paper we focused on Nordic long-run economic performance and wages by investigating whether convergence (or divergence) emerged over time among the Nordic countries. Moreover, we examined whether they converged toward the economic leaders of the 19th and 20th centuries, namely the UK and USA. Our first comparative mirror was the development of real GDP per capita from the early 19th century to 2010. Our analysis suggests that there was a catch-up process that surfaced among both the Nordic economies themselves and in their relationship with the economic leaders, especially from the early 20th century up until the 1970s.

Our second comparative mirror was the development of Swedish and Finnish real wages from the 16th to 20th century, and the results indicate very similar development between these two countries, with Sweden having higher standards of living, up until 18th century. After that, both countries diverged from the West European “path”, and especially Finland seemed to stagnate during the 19th century. Our third comparative mirror pertained to the analysis of a large sample of seamen’s wages in Sweden and Finland from the mid-17th century to the First World War. Based on our findings, divergence was not a uniform phenomenon in the 19th century Nordic sphere, since sailors’ wages increased substantially during the so-called first era of economic globalization. It is possible that export-led growth path of the Nordic countries already emerged in the late 19th century, although the impact and implementation would not materialize fully until the post-Second World War period.

Obviously our comparative mirrors and this paper are still works in progress. We still need to do more to flesh out the various institutional and other changes that are linked to these processes of change over time. Moreover, we need to refine the convergence analysis performed in the first part of the paper, and look for more data on Denmark and Norway. However, the early findings are interesting, for example from the perspective of the large body of literature on the Great Divergence and Little Divergence. It seems that the Nordic countries did not fit neatly
into this pattern. Furthermore, our findings also suggest that we should be careful in generalizing from real wages for entire countries – sometimes certain sectors (like shipping) could thrive amidst a general trend of divergence from growing economies. The Nordic path towards high equality, thriving schools, and extensive welfare states, while accompanied by relatively rapid economic growth\(^{43}\) seems to have mostly occurred in the 20\(^{th}\) century, although the roots of these processes can surely be traced further back in time. In this paper we have barely scratched the surface on these larger questions.

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