Scandinavian Economic History Review

ISSN: 0358-5522 (Print) 1750-2837 (Online) Journal homepage: http://www.tandfonline.com/loi/sehr20

Why did Swedish regional net migration rates fall in the 1970s? The role of policy changes versus structural change, 1945–1985

Jakob Molinder

To cite this article: Jakob Molinder (2018) Why did Swedish regional net migration rates fall in the 1970s? The role of policy changes versus structural change, 1945–1985, Scandinavian Economic History Review, 66:1, 91-115, DOI: 10.1080/03585522.2018.1433228

To link to this article: https://doi.org/10.1080/03585522.2018.1433228

Published online: 16 Feb 2018.

SCANDINAVIAN ECONOMIC HISTORY REVIEW, 2018
VOL. 66, NO. 1, 91–115
https://doi.org/10.1080/03585522.2018.1433228

Routledge
Taylor & Francis Group

Why did Swedish regional net migration rates fall in the 1970s? The role of policy changes versus structural change, 1945–1985

Jakob Molinder[a,b]

[a]Department of Economic History, Lund University, Lund, Sweden; [b]Department of Economic History, Uppsala University, Uppsala, Sweden

ABSTRACT

The relationship between local labour market conditions and regional migration has been widely discussed within research. In Sweden, where interregional migration reached a peak in the 1960s but decreased substantially in the 1970s, the role of economic policy has been especially contended in light of the Swedish model and its official stress on regional mobility. By collecting and creating a new and unique dataset on net-migration, vacancy rates, employment and labour income by county, the pattern of interregional migration in Sweden is analysed over a period of time that also covers the early postwar period (1945–1985), allowing for a detailed evaluation of the drivers of migration at different times. My results suggest that there was no significant change over time in the responsiveness of migration to local labour market conditions. The changing patterns of regional migration were therefore more likely the result of changes in the pace and direction of structural change. I discuss the implications of these results for previous accounts of the Swedish model and of the decline in migration after 1970.

ARTICLE HISTORY
Received 20 February 2017
Accepted 22 January 2018

KEYWORDS
Swedish model; regional migration; labour markets; economic restructuring

1. Introduction

The process of structural change – when workers shift from low-productivity activities into expanding sectors – also entails a large-scale movement of people between regions. This interaction between local labour markets and regional mobility has been increasingly noticed as a producer of economic growth and rising wages at the national level (Blanchard & Katz, 1992; Krugman, 1993; Moretti, 2011). In the neoclassical model, such flows of the factors of production indicate a deviation from long-run equilibrium. According to the model, capital owners move production because they can increase profits, while labour relocates to gain higher wages or to increase their chances of employment, this is all done in a relatively comfortable way.

The extent of interregional migration varies between countries and time periods; however, allowing for a discussion of which political-economic frameworks are more or less successful in facilitating growth through economic restructuring and regional mobility (Decressin & Fatás, 1995; Eichengreen, 1993; Lundh, 2006). In this context, the Swedish model has been seen as a blueprint for achieving such rapid movements from low- to high-productivity activities by relocating labour from declining to expanding regions (Alexopoulos & Cohen, 2003; Edin & Topel, 1997; Enflo & Rosés, 2015). As a result, the starting point for a book published by The National Bureau of

CONTACT Jakob Molinder jakob.molinder@ekh.lu.se, jakob.molinder@ekhist.uu.se Lund University, Scheelevägen 15 B, 223 63 Lund, Sweden; Uppsala University, Ekonomikum, Kyrkogårdsgatan 10, Box 513, 75120 Uppsala, Sweden

Economic Research (NBER) in the 1990s (Freeman, Topel, & Swedenborg, 1997) was that labour market adjustment was greater in Sweden because of the set of policies associated with the model (see, especially, the contributions to the volume by Edin & Topel, 1997; Forslund & Krueger, 1997). However, several authors have suggested that the models influence on actual government and union policy was the strongest in the 1960s, while the 1970s moved several steps away from it (Erixon, 2010; Henrekson, Jonung, & Stymne, 1996). Consequently, the extent of regional migration, peaking during the 1960s but decreasing substantially in the 1970s, has been connected to the rise and subsequent demise of the Swedish model (Bengtsson & Johansson, 1993; Nilsson, 1989).

The reason for this decline in internal migration is not very well understood, however. Over time, such changes in migration patterns can be the result of two factors: a change in the response of regional migration to local labour market conditions or by a change in the dispersion of those conditions (Dribe, 1994; Eichengreen, 1993). To this first aspect of migration responsiveness, some authors have pointed to several policy changes that could have decreased the incentive for migration around this time. According to this line of argument, transfer payments and regional policies changed the motive for moving (see, for example, Bengtsson & Johansson, 1993; Dribe, 1994; Lundholm, 2007; Nilsson, 1989). The Employment Protection Act (*Lagen om anställningsskydd: LAS*) and similar increases to labour market protection introduced in the 1970s have, likewise, been argued to decrease incentives for migration (Lundh, 2006). The point has also been made that an increase in tied-movers, as female labour force participation rose significantly during the 1970s, led to less overall migration (Lundholm, 2007).

To the second aspect, of the dispersion in labour market conditions, it has been contended that decreasing income differences across regions contributed to the decline in migration during the 1980s and 1970s (Bengtsson & Johansson, 1993; Dribe, 1994).

Previous studies dealing with this issue have, however, only analysed the decline in migration after 1970 in relation to the 1960s, since data before 1961 have previously not been available. As pointed out by Nilsson (1989), the 1960s is not necessarily the best point of reference, since migration and structural change were especially strong during this decade. Using new data for the period from 1945 to 1985 on county-level net-migration rates, vacancy rates and labour income, I will analyse these processes from a long-term perspective that also covers the early postwar period, making it possible to put the decline in interregional migration inthe 1970s into its proper historical context. Doing this allows me to assess whether migration declined as a consequence of lower responsiveness, or if it was due to less dispersion in labour market conditions across places. This will speak to the question of whether institutional changes introduced at this time decreased the willingness to migrate. Since the dispersion in labour demand, as well as relative incomes across regions, also fell rapidly, it will allow me to see which factors mattered more for the fall in migration rates.

My results indicate that relative labour income per employee has not been a significant driver of net-migration at any point in time. The relative vacancy rate, on the other hand, has been a statistically and economically significant factor for migration in all periods. Most importantly, however, there is no statistically significant difference in the response of net-migration to the relative vacancy rate between any of the periods, as far as I can estimate using these data.

These results lends support to Rehn and Meidner's idea of a stronger response of migration to local labour demand than to relative income differences. This also means that the decline in income dispersion across counties cannot explain the decline in migration in the 1970s. It is additionally not true that the economic policies in the 1970s made migration less responsive to local labour market conditions. Instead, the rate of migration at different times – high in the 1960s and much lower in the 1970s – seems to be the effect of how dispersed local labour market conditions was at different times. This could, in turn, be the result of exogenous structural change as well as changes in economic policy. Thus, by studying regional migration using a longer time period than previous studies, I have been able to give a new perspective on the pattern of population movements in Sweden during the postwar period.

The rest of this essay is organised in the following way. In Section 2, I describe the background to the Swedish model of structural change in more depth and discuss the previous literature. In Section 3, the patterns of migration, employment and wages in Swedish regions are presented and

the county-level data used in the essay are introduced. In Section 4, I present the methodology and regression results. Finally, in Section 5, the results are discussed and conclusions are provided.

2. The Swedish model, economic restructuring and regional migration: background and previous research

Throughout the early postwar period, Sweden was one of the fastest growing economies in the world. By the 1970s, it had completed a transformation from a relatively backward and predominately agricultural country to a mature industrial economy (Henrekson et al., 1996). Sweden did not participate in the Second World War, leaving it with an intact productive capacity, enabling it to start momentarily exporting to a reconstructing Europe. Unemployment fell to a record low and the pressure on wages and prices grew. In an attempt to curtail these inflationary pressures, the Trade Union Confederation (LO) agreed to a wage freeze in 1950; the only result was that prices exploded when wage negotiations were once again freed. This made the trade union economists Gösta Rehn and Rudolf Meidner doubtful about the prospects of wage restraint as a way to maintain low inflation and export competiveness. Instead, they started to discuss an alternative path, which took form in a report to the LO congress in 1951 and was fully developed in a second report to the congress in 1961.

The idea presented therein, often also referred to as the Rehn-Meidner model but henceforth consequently called the Swedish Model, had three pillars; first, centralised wage negotiations between LO and the Employers Association (SAF) should be used to facilitate a rational wage structure according to the principle of 'equal pay for equal work', independent of the geographical location of the worker or the ability to pay by the individual firm. Second, a tight fiscal policy should insure that inflationary pressures were mitigated. Third, workers who were dismissed in regions with declining employment and unproductive firms should be relocated to expansive regions and industries through state expenditure on active labour market programmes (ALMPs), especially retraining programmes and relocation allowances (Erixon, 2010; Hedenborg & Meidner, 1984).

The first round of what would become continually centralised wage negotiations took place in 1956, that in the account of Swenson (2002), was urged on by SAF who saw it as a way to achieve its own goals of limiting 'illicit' wage drift and achieving aggregate wage restraint. During the recession of 1957-19-58 the government had accepted the principles of the Rehn–Meidner plan and expenditures on ALMPs increased markedly. During the 1960s, regional restructuring was also especially intensive with rapid shift out of agriculture (Edin & Topel, 1997; Lundh, 2006). A central tenet of the model was the view that the elasticity of migration to regional income differences was small in comparison to the response of local vacancies (Nilsson, 1989; Rehn, 1977). The solidaristic wage policy should, therefore, be used to lift up wages in low-income regions, thereby destroying employment and forcing workers to move to expanding regions (Enflo & Rosés, 2015).

A considerable amount of studies have investigated the effect of local labour market conditions on regional migration in Sweden (for example: Dahlberg & Holmlund, 1978; Gärtner, 2014; Nilsson, 1985; Westerlund, 1997, see Westerlund, 2001 for a survey). Some of these have also studied the effect of some specific policy. Westerlund (1998) analyses the relocation allowances, Nelson & Wyzan (1989) the tax equalization system and Fredriksson (1999) the relief work. The general conclusion has been that unemployment and employment opportunities have been important drivers of regional migration while wage differences have not, much in line with what Rehn and Meidner had argued. The evidence regarding economic policy is more mixed. Westerlund (1998) finds no effect of relocation allowances for the period 1970–1989 and Nelson & Wyzan (1989) find a negative effect of the tax equalisation system but no effect of regional policy and mobility grants for the period 1979–1984. The lack of an effect of regional wage differences has been questioned recently by Gärtner (2014), however, who found a positive effect by applying a more refined statistical method on the same data as used by Westerlund. These studies, however, share the common trait that of only considering a short period of time, neglecting the period before the 1960s.

Lundh (2006) takes a long-run perspective on regional migration and looks at patterns over several time periods. He posits that selective labour market interventions should have been more effective during the situation of excess demand for labour that characterised the period 1945–1965. However, he also acknowledges that mobility may have been impeded by the solidaristic wage policy through the restrictions on wages in expansive branches. Svanlund (2009) analyses the migration between Finland and Sweden during the postwar period. After the introduction of a common Nordic labour market in 1954, the conditions were similar to those that applied to internal migration in Sweden. While previous studies have not been able to identify the effect of income differences between the two countries, Svanlund finds that besides the coincident of excess supply in Finland and excess demand in Sweden, differences in income were a strong driver of migration during the period of income convergence. Enflo & Rosés (2015) study the drivers of income convergence in Sweden and argue that while market forces were the main driver in the compression of regional income differentials during the period from 1860 to 1940, in the subsequent era from 1940 to 2000 government policies were the main impetus for this same process of income levelling. During the postwar period through the relocation of the workforce to expanding regions; and from the 1980s onward, when regional incomes started to diverge; through subsidizes to firms in areas with declining employment.

Several explanations have also been given for the decline in migration after 1970. Nilsson (1989) claims that movement away from the stress on mobility that characterised the Swedish model in the 1960s meant that migration became less responsive to local labour market conditions. Dribe (1994) argues, instead, that the decline in wage dispersion produced by the solidaristic wage policy made the incentive to move much weaker. Bengtsson & Johansson (1993), Dribe (1994) as well as Nilsson (1989) also highlight the introduction of regional policy and the increase in transfer payments as a reason for a lower migration response. They argue that the incentive to move due to low labour demand became less clear because these systems were designed to alleviate the effect of depressed local labour markets. Lundh (2006) also argues that the introduction of LAS and similar increases to labour market protection introduced in the 1970s had effects for mobility. It is, however, a priori not clear how this would affect net-migration rates. Those with employment had less reason to move, while labour market outsiders might have faced a higher incentive. To enjoy the benefits tied to employment, they had to move where jobs were available. The increase in labour market protection could also make firms less willing to hire, thereby reducing the total number of vacancies. This would then show up in the statistical estimate through a lower coefficient on relative income, but a higher responsiveness to vacancies.

Additionally, Lundholm (2010) provides a more demographic explanation arguing that the decline in migration could in part be explained by an increase in tied movers. As female labour force participation grew, long-distance migration became less responsive since both persons in a couple had to gain from the move.

A commonality among all of these studies is that they do not consider the period before the 1960s. If the decline in internal migration after 1970 took place from a unusually high level, the explanations linking the pattern of migration to phenomena that appeared in the 1970s might be inaccurate. Since during the period before the 1960s regional income differences where large, the level of transfer payment relatively low, there where no regional policy and there was no solidaristic wage policy. Thus, this period provides a useful reference for what happened in the 1960s and 1970s. In the next section, I present the data and discuss the patterns of migration in Sweden during the postwar period.

3. Net-migration and regional labour markets

The geographical division used in this essay coincides with the Nomenclature of Territorial Units for Statistics 3 division (NUTS 3) and refers to the 24 Swedish counties (*län*) that existed until the creation of the two large counties of Skåne in the south and Västergötland in the west in the 1990s. To organise the descriptive discussion, the counties will be grouped into five regions. The first, named 'Metropolitan', encompasses the three major urban centers of Stockholm in the east, Göteborg in the

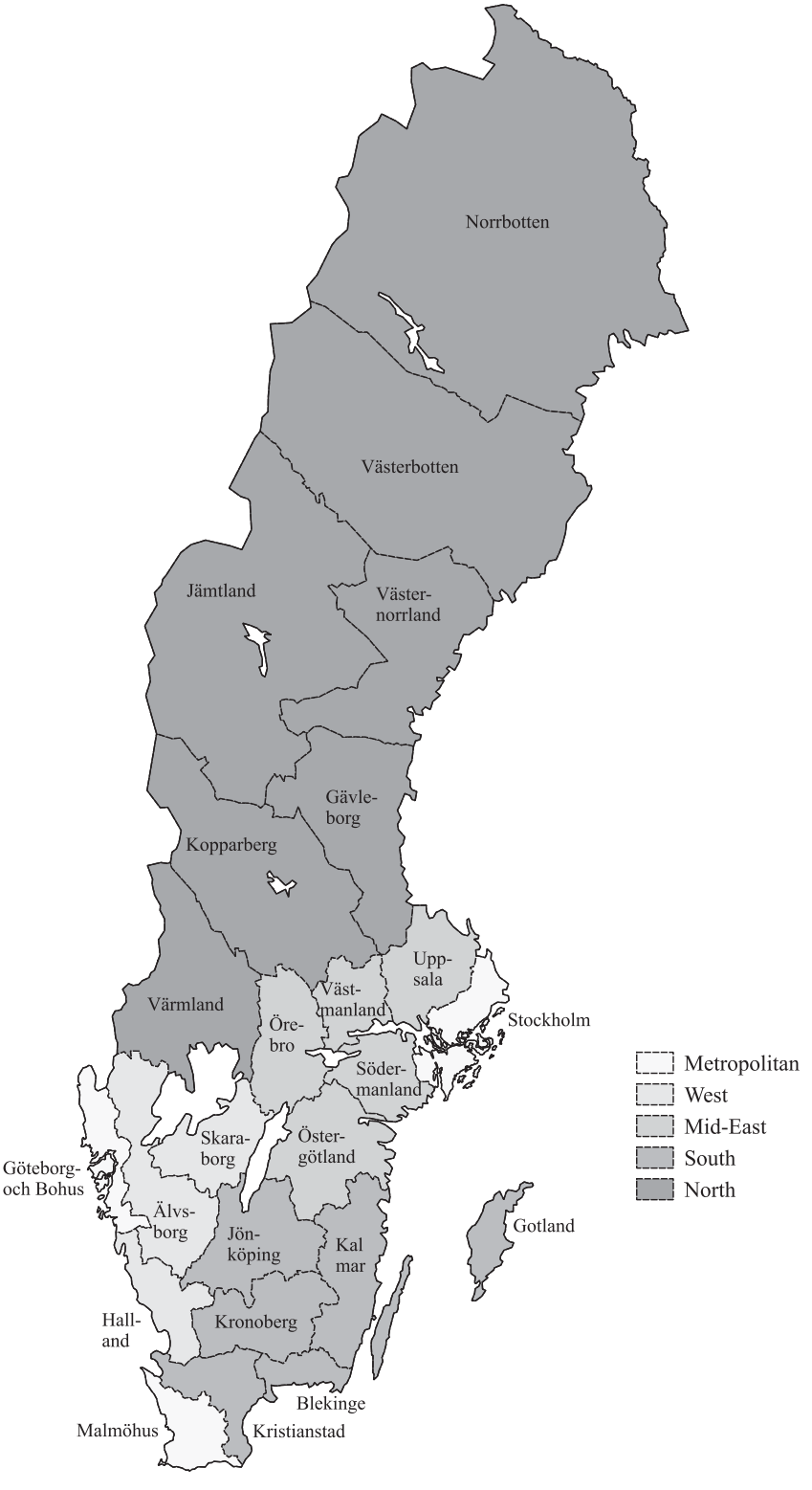

Figure 1. Map of the Swedish counties and regional division.

Note: Own map created using GIS-software.

west and Malmö in the south. Otherwise, the regions refer to four wide geographical areas shown on the map in Figure 1.

3.1. A new dataset

The data used in this study consist of two parts: information on population changes used to calculate net-migration rates and information on labour market characteristics used to calculate vacancy rates and labour income per employed. By using previously unused sources, I am able to create a dataset that is consistent throughout the period from 1945 to 1985 and is unique for any study of regional migration in Sweden or elsewhere. In the case of Sweden, data have previously only been used for the period after 1960.[1] Because of data limitations I am forced to stop in 1985. After this time, there was a reorganisation in the reporting of employment in the labour force survey. At the same time, the reporting of vacancies ceased and information was only provided on the number of persons searching for jobs. While this naturally limits the analysis, I believe that the new information for the early postwar period still is a significant addition to the literature.

The information used to calculate net-migration rates is data on population, live births, deaths, number of immigrants from other countries and the number of emigrants to other countries at the county level. These have been gathered from the official publication 'Vital Statistics' (*Befolkningsrörelsen*) 1945–1960, 'Population Changes' (*Folkmängdens förändringar*) 1961–1966 and 'Population Changes, part 3' (*Befolkningsförändringar, del 3*) 1967–1990 published by Statistics Sweden (*Statistiska centralbyrån: SCB*) on a yearly basis. The figures on population, births and deaths are based on the parish registers compiled in every parish in the country, which is gathered from the notices sent in by the clergy to the province registration offices and then forwarded to SCB. The emigration statistics are based on notices used in the civil registration. For the years up until 1964, the figures are divided between the countryside and the cities for each county in the tables. The information has, in all cases, been converted to the county level since there is no partition of the data for later periods. The same is true for *Stockholms stad* and *Stockholm län*, which until 1966 were two different counties, but has been aggregated to *Stockholms län* for the whole period. Such calculations of net-migration have previously been done for the Swedish counties by, for example, Nilsson (1989) and Fredriksson (1999) but this is the first study to do this as well for the period from 1945 to 1960. Thus, this material gives a unique picture of long-run net-migration to and from the Swedish counties over the whole of the postwar period.

Information on population is given at three points in time each year: the 1st of January, the estimated population at mid-year and the 31st of December. The net win or loss that a particular county experienced from migration within Sweden can be calculated indirectly by using the information the population figures provide. The calculation has been done in the following way. For every county I first calculate the change in population in the county during that year using the following formula:

$$dPOP_t = POP_t^{31st\ Dec} - POP_t^{1st\ Jan}, \tag{1}$$

where $dPOP_t$ is the change in population during year t, $POP_t^{31st\ Dec}$ is the county population on the 31st of December and $POP_t^{1st\ Jan}$ is the county population on the 1st of January.

I then calculate the net of internal migration to the county using the following formula:

$$m_t = dPOP_t - (BORN_t - DEAD_t) - (IM_t - EM_t), \tag{2}$$

where m_t is the net-migration to or from the county at year t, $dPOP_t$ is the change in the population during the year, $BORN_t$ is the number of births, $DEAD_t$ is the number of deaths, IM_t is the number of

[1]Lundh (2006) is an exception of a migration study that do take such a long-term perspective. However, Lundhs study is mainly descriptive and does not use migration concepts that are consistent throughout the period or relate them to information on local labour market characteristics.

immigrants from abroad and EM_t is the number of emigrants to another country. In other words, net-internal migration is what is left of the population change after accounting for the effect of natural population increases and net-migration from other countries.[2] The net-internal migration *rate* is then calculated by dividing the number of net-migrants by the population in the middle of the year.

$$M_t = m_t / POP^{\text{mid}-\text{year}}, \tag{3}$$

where M_t is the net-migration rate in year t, m_t is the net-migration level and $POP_t^{\text{mid}-\text{year}}$ is the county population in the middle of the year.

The data on labour market characteristics used to calculate the vacancy rate and labour income per employed consist of data for the number of employed persons, the number of vacancies and total labour income in each county. The vacancy data are created by compiling and linking two datasets from the Swedish public labour exchanges. For the period 1963–1985, the data were printed in the publication Labor Market Statistics (*Arbetsmarknadsstatistik*) produced by the Labor Market Board (*Arbetsmarknadstyrelsen: AMS*). Before 1963, the data have instead been collected from the annual audits of AMS. For the period from 1945 to 1975 the data refer to the number of vacancies. From 1963 to 1985, the data refer to the number of remaining vacancies for each month and the yearly figures is a 12-month average. The two datasets have been linked using information from the period 1963–1975 when they overlap.

To perform the linking, a first step is to examine whether there is a strong enough association between the two series to make this possible. To see whether this is the case, I have estimated a regression where the vacancy data for the 1945–1975 period Vac_1 is explained by the data for the 1963 to 1985 period; Vac_2 and county fixed effects, for the overlapping period 1963–1975. The coefficient for Vac_2 is 0.87 and the adjusted R^2 is 0.94. Thus, the association is very strong and the model can account for most of the variation in Vac_1 during the overlapping years. The second step is to use the prediction from the model in the first step to link the two datasets. Since I have overlapping data for the years 1963–1975 I use a geometrically declining linking parameter so that in 1963 the series is equal to Vac_1 and in 1975 equal to the prediction from the model with Vac_2 as the dependent variable (and with county fixed effects). For the in-between years, the linked series is a mix of the two where in 1969 the weight for each series is 50%.

The labour income data are derived from tax assessments published by SCB on an annual basis. The assessments are based on tax returns made by the taxpayers to local assessments boards. The definition of labour income is the assessed income from employment and temporary earnings for physical persons, undivided estates and family trusts. To clarify, this is the amount of income before any deductions or taxes paid at the local or state level. The published tables from SCB give this information for each county. The data on employment before 1970 are derived from the same source and refer to persons earning income from business and/or employment. The biggest change to the definition in the tax assessments took place in 1952 when jointly taxed spouses were no longer counted as belonging to the highest earner within the household but was instead reported separately.

To create the series for employment, the data on income earners have been linked to the Labor Force Survey (*Arbetskraftsundersökningen: AKU*) published by SCB using 1970 as the benchmark. Starting in 1970 the AKU was conducted on a monthly basis in employment figures presented at the county level. For each year until 1970, the change in the number of employed has been estimated from the tax assessments and linked to the number of employed in the censuses. The censuses were conducted in 1945, 1950, 1960, 1965 and 1970. The AKU figures for 1970 onwards have been scaled by the difference between the census figures in 1970 and the AKU figures in 1970. Labour income per employed person has been calculated by dividing labour income from the tax assessments by the

[2]For example in 1965, Stockholms län had a population increase between the 1st of January and 31st of December of 31,617 persons. The effect from natural population increase (Births– Deaths) was 9759 and the net number of people who moved to Stockholm's län from abroad was 4547. This means that of the 31,617 persons that the population increased, 17,311 is explained by migration from other parts of Sweden (31,617 − 9759 − 4547 = 17,311).

linked employment series. The vacancy rate is calculated by dividing the number of vacancies by the number of employed.

One possible problem with using data at the county level is that it masks movements between places within county borders. This could especially be a problem for the northern counties where the distance within the county could be much larger than that between metropolitan areas close to county borders. However, studies of migrant behaviour have shown that it is mainly in the metropolitan areas of Stockholm, Göteborg and Malmö and the counties bordering them that the number of commuters is significant. The county as an approximation for local labour markets might also be defended on the basis that cross-county migration has been shown to be more labour-market oriented (see, for example, Nilsson, 1995, p. 13).

3.2. Regional migration

Figure 2 shows the pattern of net-migration for each county over the 1945– 1985 period, calculated using Equation (3). This gives a unique and previously unavailable view of migration patterns for the whole postwar period in Sweden. As evident from the figure, the general tendency over the period has been out-migration from the peripheral, sparsely populated and mainly agricultural regions towards the metropolitan counties.

Looking at the individual series, the tendency of out-migration has been especially strong in the counties in northern part of the country along with the south-eastern counties of Gotland, Kristianstad and Blekinge. During the 1950s only the Metropolitan and Mid-East counties, which encompassed all the eight major Swedish city centers in 1960, saw positive net-migration and the former accounted for 80% of this inflow. This tendency of urbanisation became even stronger and reached a peak in the 1960s, with a historically large outflow, in particular, from the northern counties. The strong inflow to the counties of Uppsala and Halland during the 1960s is another important pattern, likely explained by their proximity to Stockholm and Göteborg, respectively. During the 1960s and 1970s, car ownership rose strongly and suburbanisation was an important phenomenon. In Sweden, new satellite communities were built outside of the larger cities. In addition, relatively cheaper land could be exploited for private family houses since the increase in car ownership made residency further away from the city available to people working in the centre. This was true for the southern part of Uppsala län, bordering Stockholm and for the northern part of Halland where new suburbs to Gothenburg were built. The availability of cheap land made residency attractive, while the expansion of the road network created access to the larger urban area. This is a likely explanation for the high net-migration rates for these counties also in the 1970s (see, for example, Borgegård, Håkansson, & Malmberg, 1995).

For the northern region, the experience of the individual counties followed the general pattern for the region. For the four northernmost counties of Västernorrland, Jämtland, Västerbotten and Norbotten, there was negative net-migration before the 1970s, reaching the lowest rate during the 1960s. For the three other Northern counties: Värmland, Kopparberg and Gävleborg, the basic pattern is the same but with smaller migration losses during the 1960s and sizeable in-migration during the mid 1970s. The three southern counties of Gotland, Blekinge and Kristianstad, heavily dependent on agriculture, experienced out-migration during the 1940s and 1950s but did not see the same negative development as the northern counties during the 1960s.

During the later half of the 1960s, the main element of structural change was still the decline in the primary industries. In the northern counties, where this tendency was especially strong, the growth in services could not balance out this loss, resulting in heavy out-migration. The growth of the public sector, likewise, played a critical role for the distribution of economic activity. However, the different phases of public service expansion had very different implications for individual regionals. During the later half of 1960s, the tendency of interregional concentration was reinforced by the growth in public education and central hospitals.

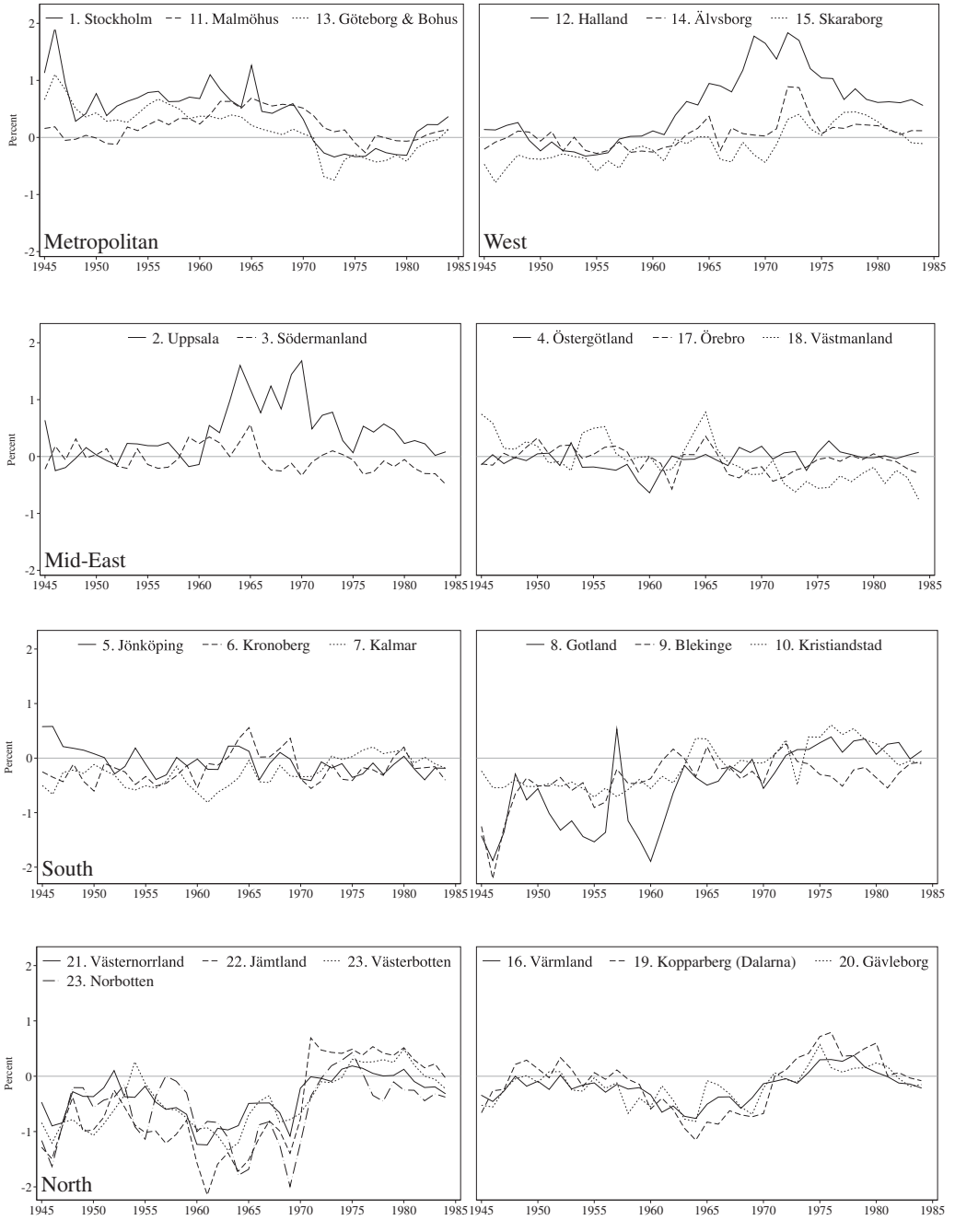

Figure 2. Regional net-migration rates 1945–1985. Net-migration as share of population.

Source: Authors calculation from population tables published by SCB.
Note: The figure shows the net-migration rate for each Swedish county between 1945 and 1985. The calculation of net-migration has been done as described in the text

In light of this, the rapid reversal of the pattern in the early 1970s is especially prominent. A resource boom resulted in a strong expansion of industrial production, mainly concentrated in the northern counties where industry was still heavily resource-based. In addition, the direction of public sector expansion started to shift towards activities closely tied to the place where people

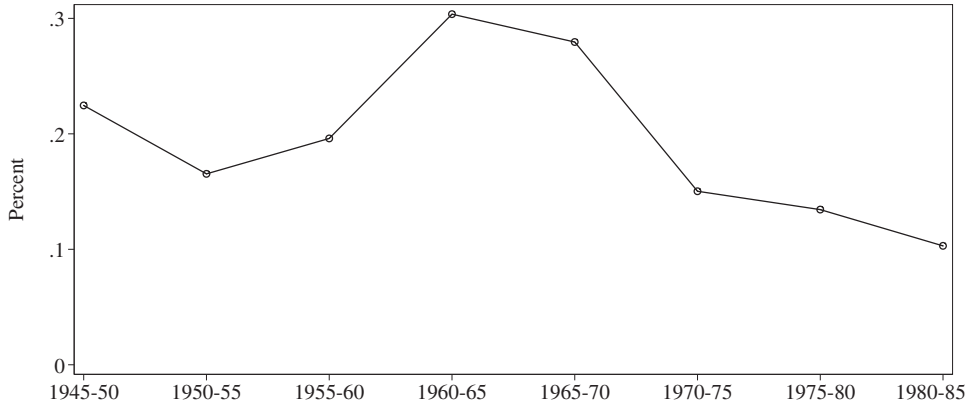

Figure 3. Net-migration to surplus counties as percentage of country population for five year intervals, 1945–1950 to 1980-19-85.
Source: Authors calculation from population tables published by SCB. Calculation of net-migration as described in text.
Note: The figure shows the net-migration to counties with surplus migration as share of country population between 1945–1950 and 1980–1985. Each point shows the mean level for that year and the previous five years.

currently lived, such as elderly- and childcare. Therefore, the growth in public sector employment was distributed much more evenly than during the 1960s (Bäcklund, 1999, p. 33).

How has the overall extent of regional migration changed over time? Following Nilsson (1985, p. 18), the rate of population relocation through migration can be illustrated by calculating the sum of net-migration to the counties with a migration surplus as a share of the total country population. Measured in this way, Figure 3 shows how the extent of migration has evolved over the postwar period. Each point in the figure gives the mean level for the previous five-year period. Nilsson has previously discussed this for the period after 1960, but, using the data collected here, it is possible to show this for the whole of the postwar period and with annual data for the first time.

The decline in the intensity of regional migration in the 1970s, as compared to the 1960s that previous authors have noticed, is very striking in the figure. This decline in overall migration after 1970 is also evident in gross migration flows between counties (Nilsson, 1995, p. 17) and parishes (Edin & Topel, 1997, p. 176). What is new, and what these data make clear, is the fact that the high level of migration during the 1960s was attained from a lower level in the 1950s. There was, however, a secular decline in total net-migration over the course of the postwar period. The intensity of regional migration was stronger in the early postwar period compared to the 1970s and 1980s, even when disregarding the unusually high levels of the 1960s.

3.3. Regional labour markets

The other aspect of internal migration is what induces people to move between places. Two factors, in particular, have been highlighted: the difference in the availability of jobs and relative income levels. Two facts, visible in Figure 4, are especially salient in the evolution of regional labour markets in Sweden. The first is the strong relative growth of employment in the three metropolitan countries and to a lesser extent in the industrial mid-east region, which has been mirrored by a relative decline in the rest of the country that produced an increasingly concentrated population (Borgegård et al., 1995). The second is the strong convergence of incomes and earnings across counties (Enflo, Henning, & Schön, 2014; Olsson Spjut, 2010; Persson, 1997).

The shift in net-migration during the 1970s is also reflected in the first panel of Figure 4 showing cumulative employment growth for each region relative to the national average. After a rapid expansion during the 1960s in the metropolitan and mid-east counties, relative employment growth was flat after 1970. This was mirrored in the experience of the northern counties. During the earlier parts of the postwar period they followed the west and the south, but during the 1960s relative

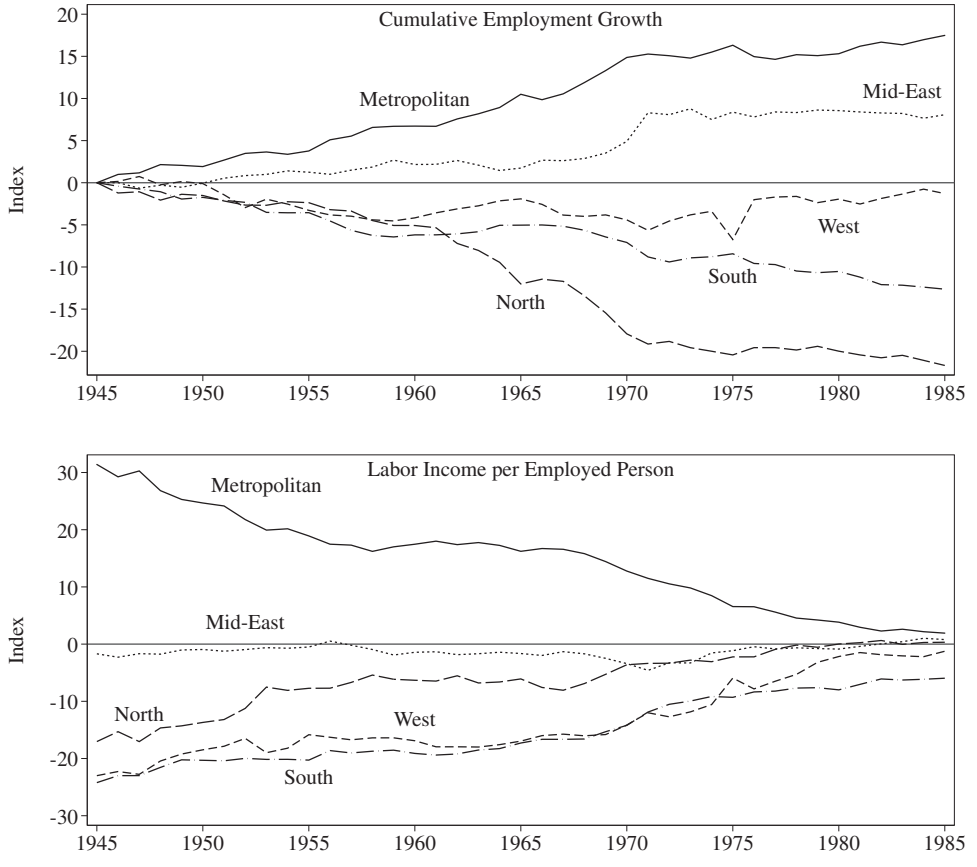

Figure 4. Cumulative employment growth and labour income per employed person, Swedish regions relative to the national average, 1945–1985.

Source: Employment from the tax assessments before 1970 and the Labor Force Survey (AKU) after 1970. Labour income from tax assessments. Calculation of county level employment and labour income per employed as described in text.
Note: The first panel shows the cumulative employment growth calculated as the regions employment index less the same employment index for the whole country, with 1945=100. The second panel shows the relative labour income per employed person.

employment loss in the north was dramatic. This changed during the 1970s when employment growth instead followed the national average.

Looking at labour income per employed, the north, west and south started out with incomes about 20% below the national average in 1945. At the same time, the metropolitan counties where substantially richer, about 30% above the national mean, while the mid-east was just at the average. Over the course of the postwar period, there was a continuous convergence in labour incomes, but with a concentration to two periods: from around 1945 to 1955 and from about 1970 to 1985. Interestingly, between 1955 and 1970 relative incomes were fairly stable. By 1985, full convergence had almost been reached as no region had an average income 10% above or below the national average.

A Hoover-index can also be used to illustrate how spatially concentrated economic activity appears at different periods in time. The index, which is displayed for five-year periods in Figure 5, relates each county's relative proportion of Sweden's area to its relative proportion of the country population, employment and vacancies. The index approaches 100 as activity becomes more geographically concentrated. The figure shows that employment was more geographically concentrated than population throughout the postwar period. This general difference is not very surprising and is probably related to differences in demographics and labour-force participation across regions.

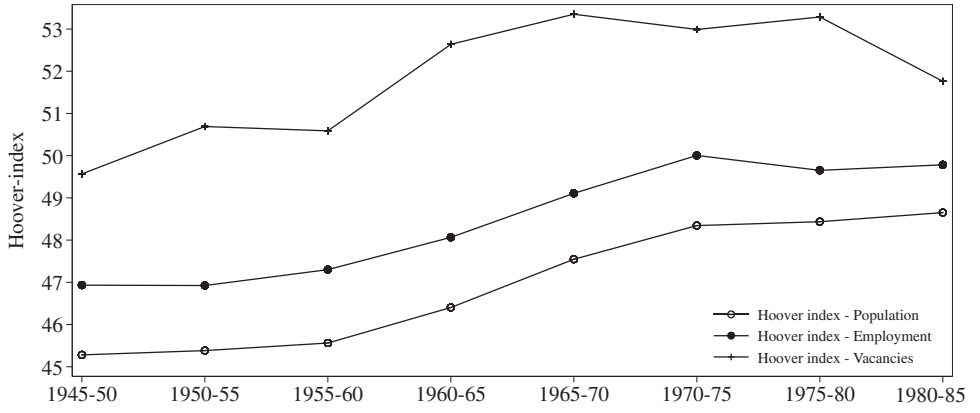

Figure 5. Hoover-index of population, employment and vacancies, 1945–1950 to 1980–1985.

Source: Population from population tables published by SCB. Employment from tax assessments before 1970 and the Labor Force Survey (AKU) after 1970. Vacancies from the Labor Market Board:s (AMS) annual audit and the publication 'Labor market statistics' (Arbetsmarknadsstatistik) published by AMS. County area from SCB.

Note: The figure shows the Hoover-index of population, employment and vacancies for five-year periods between 1945 and 1985. The Hoover-index is calculated as $H = 50 \sum_{n}^{i=1} (p_i - a_i)$ where H is the Hoover-index, p_i is county and *i*s share of total country population, employment or vacancies and a_i is the county and *i*s share of the country total area.

Vacancies is most concentrated however. Looking at the evolution over time, the index shows that the 1960s constituted a breakpoint when there was an unprecedented increase in concentration of all three variables. Not surprisingly, given the turn in net-migration, the index is consequently flat for population and vacancies and decreasing for employment during the 1970s.

4. The response of net-migration to regional labour market conditions

In this section, the model used to estimate the effect of the relative vacancy rate and relative labour income on regional migration is presented. To organise the empirical investigation, I split the sample into three partly overlapping time periods; 1945–1965, 1955–1975 and 1965–1985. These are my main focus when analysing changes in the response of regional migration to local labour market conditions. However, later on I also use a more flexible rolling-window approach to verify that the results are not sensitive to the selection of time periods. A shorter timespan of 15 years, with less overlap than the 20-year period in the baseline estimates, will also be considered. A limitation is that, in order to get enough observations to precisely estimate the migration equation and to be able to account for time dynamics, I have to use time periods that overlap. Therefore, it is only possible to assess whether the moving of the observations window, from for example 1955–1975 to 1965–1985, has a large enough effect on the estimated coefficient that the difference is statistically and economically significant. While this leads to a loss of information about the difference in the migration response when periods overlap, it will result in smaller error bands. Recall also that I can compare the first 20-year period (1945–1965) and the last (1965–1985) without any overlap.

4.1. Empirical model and estimation

In order to assess the relative response of net-migration to regional labour market conditions during different time periods, the approach I use is to estimate the same model for each of the three time periods respectively. The model that I will use closely follows the model first pioneered by Pissarides & McMaster (1990), which they used to estimate a net-migration equation for Great Britain. The model relates the regional net-migration rate to relative labour demand and relative wages, while allowing for regional fixed effects to control for time indifferent factors such as differences in age

structure and labour force participation. Additional controls could be added but, as argued by Eichengreen (1993) when comparing migration responsivness between countries, or as in this case between time periods, it is better to opt for a parsimonious formulation of the regression. Furthermore, since there is reason to suspect that the independent variables are correlated with the cross-section specific constants, a random-effects estimator would give biased estimates of the coefficients for the independent variables. The drawback is that it will not be possible to examine the effect of variables that vary between the cross-sectional units, but does not vary much within each cross-section.

Another concern is the possibility that the net-migration rate, the vacancy rate or labour income are not stationary. It is a common worry that if nonstationary variables are included in a regression, this may lead to spurious correlations between the variables because of the deterministic time component embedded in them. Beck & Katz (2009) argue, however, that if the variables are observed on an annual basis and are bound in their values, for example between –100 and 100 as the case of the net-migration rate, there is little reason to believe that variable to be non-stationary. Furthermore, if the variance of the series is not increasing over time and the error from the regression model is stationary, they suggest that methods for stationary data can still be used. Even so, I decided to address the issue of non-stationarity by performing a series of panel-unit root tests and detrending the variables in cross-sections where trends are detected.

I have run three such panel unit roots tests: the Levin, Lin and Chu and Harriz-Tzavalis tests, which tests against the null of a common unit root process in the included cross-sections and the Lm, Pesaran and Shin test for cross-section specific unit roots. For net-migration and the deviation in the vacancy rate, I can reject the null of a panel unit root for both the original and the detrended variable. For the deviation in labour income, I cannot reject the null for the original variable but for the detrended variable. Thus, in what follows, I use the detrended variables, while checking that the results are also robust when using the original variables.

When choosing the regression specification, I use the process suggested by De Boef & Keele (2008) of first estimating a general dynamic auto-regressive distributed lag model that includes both an autoregressive term in the form of a lag of the dependent variable, as well as a contemporaneous and a lagged effect of the independent variables.[3] The general model is of the following form:

$$Y_{t,i} = \alpha_0 + \alpha_1 Y_{t-1,i} + \beta_0 X^j_{t,i} + \beta_1 X^j_{t-1,i} + \alpha_i + \varepsilon_{t,i}, \tag{4}$$

where $Y_{t,i}$ is the dependent variable and $X^j_{t,i}$ is the jth independent variable. Restrictions of this general model are then tested using the Bayesian information criteria (BIC). I followed this process for each time period and found that the appropriate model in all periods, except 1945–1965, was the partial adjustment model that includes a lagged dependent variable but only contemporaneous effects from the independent variables. For the 1945–1965 period, the general model is preferred by the BIC. The difference in the BIC between the partial adjustment and the general model is very small, however. Therefore, to facilitate a comparison among time periods, in what follows I estimate the partial adjustment model for the three sample periods. Thus, the estimated model for each time periods is

$$M_{t,i} = \alpha_0 + \alpha_1 M_{t-1,i} + \beta_0 dVR_{t,i} + \beta_1 dLI_{t,i} + \alpha_i COUNTY_i + \varepsilon_{t,i}, \tag{5}$$

where $M_{t,i}$ is the net-migration rate at time t in county i, and $dVR_{t,i}$ is the deviation of the county vacancy rate to the national average vacancy rate, $dLI_{t,i}$ is the deviation of labour income per employed in the county compared to the national average and $COUNTY_i$ is the cross-section fixed effect for each county. β_0 is the short-run impact of a deviation of the vacancy rate on net-migration, β_1 is the corresponding effect of a deviation in labour income. Thus, due to the

[3]This process also generalises to cases with more than one lag but, given the annual frequency of the data, I will focus on the case with one lag.

Table 1. Regression results.

		1945–1965	1955–1975	1965–1985
M_{t-1}	Lagged mig	0.623** (0.058)	0.603** (0.040)	0.670** (0.029)
dVR_t	Vac rate	0.006** (0.002)	0.009** (0.002)	0.005** (0.001)
dLI_t	Lab inc	−0.009 (0.007)	−0.006 (0.007)	−0.003 (0.006)
Statistics				
Fixed effects		Yes	Yes	Yes
Adjusted R^2		0.50	0.59	0.61
Observations		480	504	504
Tests (*p*-values)				
AC test (2 lags)		.23	.06	.17
FE F(df 3, 23)		0	0	0
Hausman (df 3)		0	0	0
Long-run multipliers				
		1945–1965	1955–1975	1965–1985
dVR_t	Vac rate	0.012* (0.00)	0.017** (0.01)	0.010* (0.00)
dLI_t	Lab inc	−0.036 (0.02)	−0.019 (0.02)	−0.000 (0.02)

Note: The table shows the results from estimating the model in Equation (5) on the three sample periods 1945–1965, 1955–1975 and 1965–1975 with detrended variables as described in the text. M_{t-1} is county net-migration as share of mid-year population, lagged one year; dVR_t is the log of the vacancy rate (number of vacancies divided by employment) in the county less the log of the national vacancy rate. dLI_t is the log of labour income per employed in the county less the log of the national average labour income per employed. Standard errors are in parenthesis, clustered at the county level. Standard errors for long-run multipliers estimated using the stata command *xtpmg* (Blackburne & Frank, 2007) with dynamic fixed effects option. $^*p < 0.05$, $^{**}p < 0.01$.

autoregressive nature of the model, the long-run effect of a deviation in the vacancy rate, or the total multiplier, is given by $\beta_0/(1-\alpha_1)$, and for labour income by $\beta_1/(1-\alpha_1)$. The model is estimated for each time period: 1945–1965, 1955–1975 and 1965–1985, respectively. The coefficients of the variables are then compared in order to assess how the relationship potentially changed over time.

4.2. Results

Table 1 gives the result from the regression of Equation (5) on the three sample periods 1945–1965, 1955–1975 and 1965–1985, respectively. For all three time periods the term for lagged migration, α_1, is significant and large. It is also similar across the samples ranging from 0.603 for 1955–1975 to 0.670 for 1965–1985. The interpretation is that the persistence of net-migration was slightly higher in 1965–1985 than earlier. However, the standard error of the estimate is also larger for the earlier periods.

The short-run effect of a deviation in the vacancy rate is significant across all sample periods. However, the point estimate for 1955–1975 is larger than for the other periods: 0.009 compared to 0.006 for 1945–1965 and 0.005 for 1965–1985. It remains to be seen, however, whether the short- and-long run effects are significantly different between the sample periods since the persistence of migration was higher for 1965–1985. Lastly, the short-run effect of a deviation in labour income per employed is not significantly different from zero in any of the sample periods.

The diagnostic statistics show that the null hypothesis of no fixed effects is rejected for all time periods and the same is true for the Hausman test of a fixed-versus a random-effects estimator. For the AC-test of autocorrelation in the residuals, I can also not reject the null hypothesis of no serial correlation.

Turning to the estimates of the long-run multipliers given in the second part of Table 1, the insignificant result for labour income is reproduced also when accounting for the long-run persistence in migration. For the vacancy rate, on the other hand, the long-run effect, just as the short-run effect, is significant for all sample periods. Once again, the point estimate is the highest for 1955–1975 and lowest for 1965–1985. The standard error for the coefficient for 1955–1975 is higher than for the other sample periods, however.

In order to assess whether the difference in the point estimate of the effect of a deviation in the vacancy rate is significantly different between the time periods. the precision of the estimates must be taken into account. Figure 6 displays the point estimate for the short-run effect of a deviation in

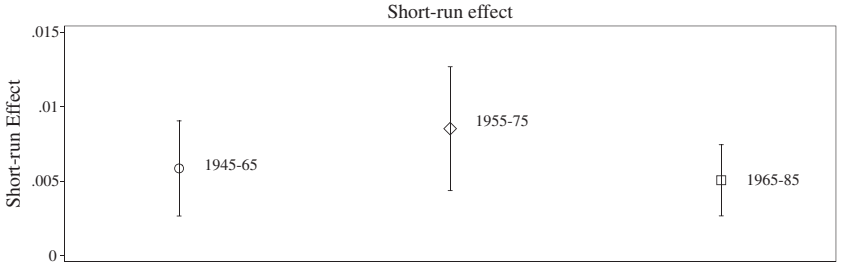

Figure 6. Point estimates and 95% confidence intervals for the three sample periods.

Note: The figure shows the point estimate for the effect of a deviation in the vacancy rate from the national average for each sample period alongside the 95% confidence interval. The point estimates are from estimating equation (5) on the three sample periods 1945–1965, 1955–1975 and 1965–1985 as in Table 1.

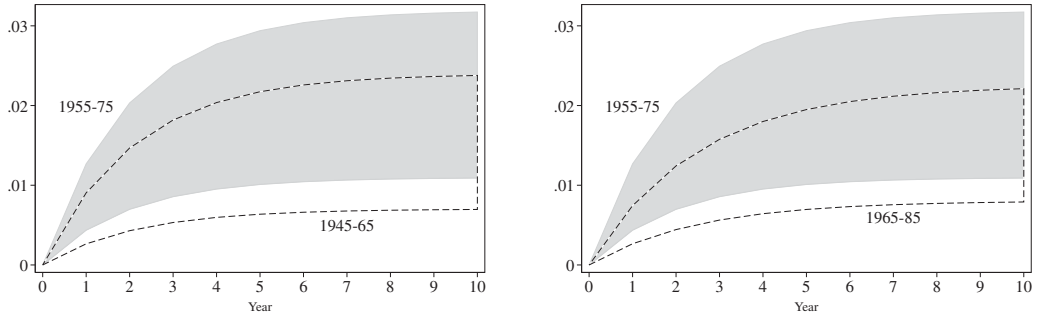

Figure 7. Impulse-response for effect of deviation in vacancy rate on net-migration. (a) 1945–1965 compared to 1955–1975, (b) 1965–1985 compared to 1955–1975.

Note: The figure shows the 95% confidence intervals for the cumulative effect of a deviation in the vacancy rate on net-migration over 10 time periods. The 95% confidence intervals are from estimating Equation (5) on the three sample periods 1945–1965, 1955–1975 and 1965–1985 as in Table 1. The cumulative response in time period one is calculated as β_0, in time period two as $\beta_0 + (\beta_0 * \alpha_1)$ and so on.

the vacancy rate alongside the 95% confidence interval. The figure shows that the confidence intervals for the short-run effect overlap for all three sample periods. The point estimate is the highest for the 1955–1975 period, although the confidence interval is broader. Most importantly, the higher bound of the confidence intervals for the time periods 1945–1965 and 1965–1985 are higher than the lower bound for 1955–1975.

Since I am dealing with an autoregressive model, the previously explained point estimates only consider the short-run effect of the deviation in the vacancy rate on long-run net-migration. To evaluate whether the dynamic effect differs between the sample periods, the full response of migration need to take into account the persistence of migration. To do this, I calculated the impulse-response function for the effect of a unit change in the deviation of the vacancy rate on net-migration. This is done by summing up for each year 1+t the cumulative impact of the unit change in the deviation in the vacancy rate in year 1. Remember that if the autoregressive factor, or the coefficient α_1, of the lagged dependent variable: $M_{t,i}$, is 0.6, then the cumulative effect in year 2 of the unit change in the deviation of the vacancy rate in year 1 will be the short-run effect + the short-run effect multiplied by 0.6. Figure 7 shows the 95% confidence interval of the impulse responses calculated in this way. In both panels the reference is the impulse-response for the 1955–1975 sample period, while the dotted lines in panel A and B show the confidence interval for the 1945–1965 and 1965–1985 sample periods, respectively. The main takeaway from this calculation is that for no year after the initial shock to the deviation in the vacancy rate is the estimated effect on net-migration statistically significantly different between the sample periods. Thus, the

impression that the effect of a deviation in the vacancy rate does not differ in a statistical sense appears to be true both in the short- and the long-run.

Some additional things can be said about the dynamic effect of a deviation in the vacancy rate on net-migration. The immediate effect, i.e. the effect in year 1, only accounts for roughly half of the long-run effect. This seems to indicate that the adjustment towards equilibrium, after a shock to the vacancy rate, takes a relatively long time. Most of the effect only took place after about five years. This basic dynamic pattern is also similar across all the sample periods.

4.3. Robustness checks

In this subsection, I consider a number of robustness checks. First, I try out a number of alternative estimation methods and formulations of the variables included in the regression. Second, I examine the baseline model to see if it is robust to the selection of time periods and to the exclusion of certain cross-sections.

As first noted by Nickell (1981), OLS estimates from models with cross-section fixed effects and a lagged dependent variable tend to be biased because of the correlation between the lagged dependent variable and the error term. The baseline model in Table 1 might suffer from such bias. Therefore, I also estimate the model using a version of the bias-corrected LSDV estimator (LSDVc), which has been found to be accurate when evaluated on short panels, such as those used here (see Bruno, 2005; Kiviet, 1995). I use 100 iterations to bootstrap the standard errors and the Arellano-Bond estimator to initialise the bias correction. The results of estimating Equation (5) using this method are shown in Table A1 in Appendix 1 and the point estimate of the effect of a deviation in the vacancy rate is shown graphically in Figure A1 in Appendix 1.

The estimates in Table A1 are very similar to those in the baseline model in Table 1. The standard errors are slightly smaller but the point estimates are almost the same. The coefficient for the deviation in the vacancy rate is statistically significant for all three sample periods while differences in labour income is not significant for any period. In this bias corrected model just as in the baseline model, the point estimate for the effect of a deviation in the vacancy rate is higher for the 1955–1975 period. Importantly, however, just as with the baseline model, there is no statistically significant difference in the estimate between the sample periods. Thus, accounting for the possible Nickell-bias bias in the estimates in Table 1 does not alter the substantive conclusion that migration responsiveness appears to be stable over time.

In Appendix 1 I also consider a number of alternative formulations of the baseline model. The results are robust to using the variables in levels instead of the deviation from the national mean. The same is true when adding time fixed effects to the model with the variables in levels. As additional robustness checks, the model is also estimated with the number of vacancies divided by population instead of employment and with income per capita instead of income per employee.

So far, I have concluded that when using the full set of counties and splitting the sample into three time periods: 1945–1965, 1955–1975 and 1965–1985, the estimated impact of a deviation in the vacancy rate is not significantly different across the sample periods. This is true for both the short- and long run-effects. This conclusion also appears robust to estimating with bias correction and to entering the variables in levels. In what follows, I perform a number of robustness test to assess whether this conclusion is robust to the selection of time periods and to the exclusion of certain cross-sections.

As a first assessment I will check if the conclusion that the response is not significantly different is true for all possible choices of time periods. To do this I have estimated Equation (5) for 20-year rolling windows starting with 1945–1965 followed by 1946–1966 and so on stopping at 1965–1985. These estimates nest the three sample periods used above and for those periods the estimate is exactly the same. However, it is now possible to see whether the estimated effect is sensitive to the choice of these three periods. Figure 8 shows the short- and long-run estimates alongside the 95% confidence intervals.

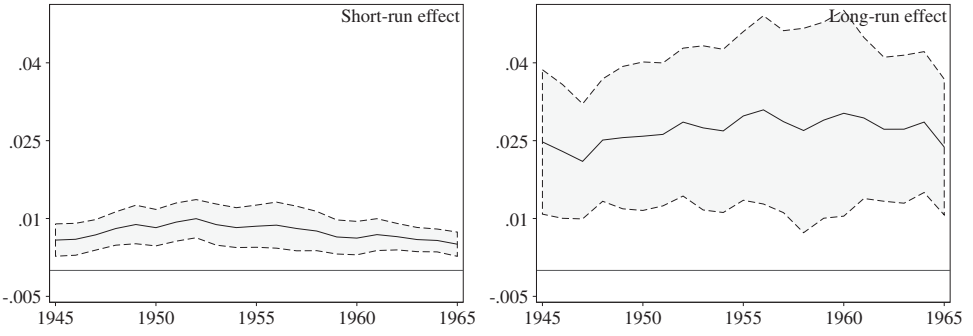

Figure 8. Coefficient estimates and 95% confidence intervals for rolling window of included observations, 20 year windows.

Note: The figure shows the point estimate and the 95 % confidence interval for the effect of a deviation in the vacancy rate on net-migration. Each year in the graph gives the estimate for the 20-year sample period so that 1945 means 1945–1965 and so on.

Each year in the graph gives the estimate for the 20-year sample period, so 1945 means 1945–1965 and so on. The result indicates that the estimate is very stable for all the possible sample periods. The point estimate for the short run effect increases slightly from 1945 until about 1953, but the change is not large enough to be statistically significant as indicated by the 95% confidence intervals. This conclusion is also clear for the estimate of the long-run effect. The point estimate changes only little and the increase that takes place is overwhelmed by the increase in the confidence intervals. Thus, the conclusion does not seem to be sensitive to the selection of sample periods. Instead, the relationship appears to be very stable over time.

To evaluate whether the overlap of the time periods is important for these conclusions, I will estimate the same rolling window but this time for shorter 15-year time periods. In this way, there will be no overlap, for example, between the 1954–1969 sample and the 1970–1985 sample. It is important to remember, however, that these estimates are substantially more imprecise; likewise, the number of time periods is smaller than the advisable number when estimating cross-section time series regressions. Most importantly, the estimates of the long-run effect will be imprecise. Figure 9 shows the short- and long-run estimates alongside the 95% confidence intervals for the 15-year windows. Just as for the 20-year windows, there is no statistically significant difference in the migration response between the sample periods. The increase in the point estimates in the early postwar period and the decrease in later years are more marked when compared to the 20-year samples. However, the increase in the point estimate is followed by a corresponding increase in the confidence intervals.

A second worry is that the results are dependent on the inclusion of specific cross-sections. It might be the case, for example, that the effect of a deviation in the vacancy rate is mainly driven by the northern counties, which report very high negative net-migration rates for much of the studied period. In the first panel in Figure 10, I have re-estimated Equation (5) for the three sample periods, 1945–1965, 1955–1975 and 1965–1985, while dropping each county sequentially. The second panel does the same thing but for each region sequentially. The points in the figure show the overlap of the confidence intervals. For each point, the 1955–1975 model is compared to the 1945–1965 and the 1965–1985 models, respectively. If the value drops below zero, the difference in the point estimate is statistically significantly different. The figure shows that excluding a country or region does not have a large enough effect to alter the estimate. Instead, the relationship seems to be very stable irrespective of the exclusion of cross-sections.

The conclusion so far is, therefore, that the results from the baseline regressions in Table 1 are stable in relation to the selection of time periods and the exclusion of individual cross-sections. A further robustness check is to examine whether the models estimated for different time periods would predict different actual patterns for net-migration. One very substantial question is whether the very high out-migration from the northern counties during the 1960s would not have happened had the migration response been different. This is the question I turn to next.

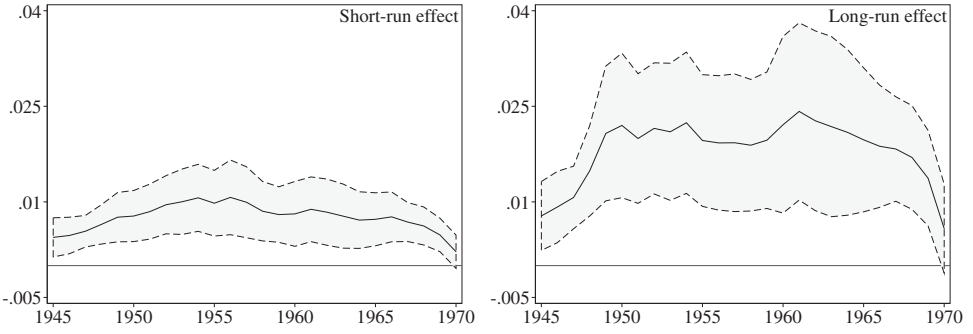

Figure 9. Coefficient estimates and 95% confidence intervals for rolling window of included observations, 15 year windows.

Note: The figure shows the point estimate and the 95 % confidence interval for the effect of a deviation in the vacancy rate on net-migration. Each year in the graph give the estimate for the 15 year sample period so that 1945 means 1945–60 and so on.

4.4. Differences in predictions from the models

In Figure 11, I plotted the confidence interval for predicted net-migration rates from each northern county during the 1960s, as predicted by the model estimated for the 1955–1975 and 1965–1985 samples, respectively, along with the actual net-migration rate. The confidence interval for the 1955–1975 sample is indicated by the light-grey area. The confidence interval for the 1965–1985 sample is indicated by the dashed lines. The actual net-migration rate is the solid line.

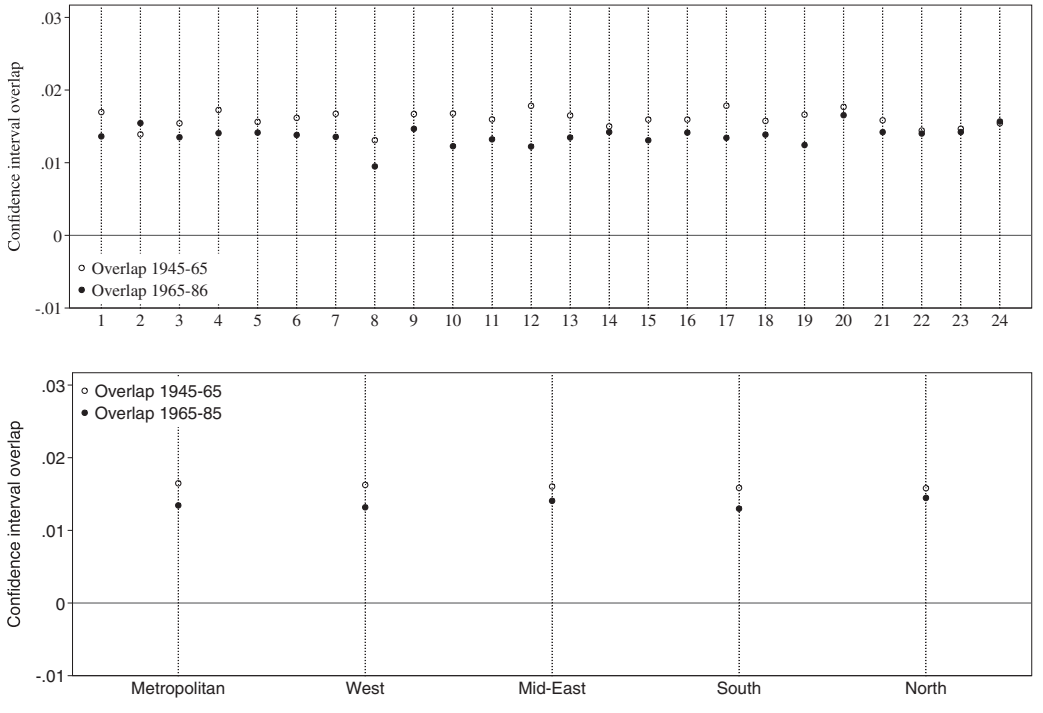

Figure 10. Overlap of 95% confidence interval when excluding observations. 1955–1975 model compared to 1945–1965 and 1965–1985 model.

Note: The points in the figure shows the overlap of the confidence intervals. For each point the 1955–75 model is compared to the 1945–1965 or the 1965–1985 model. The first panel shows the effect of dropping each county sequentially. The second panel shows the effect of dropping each region sequentially.

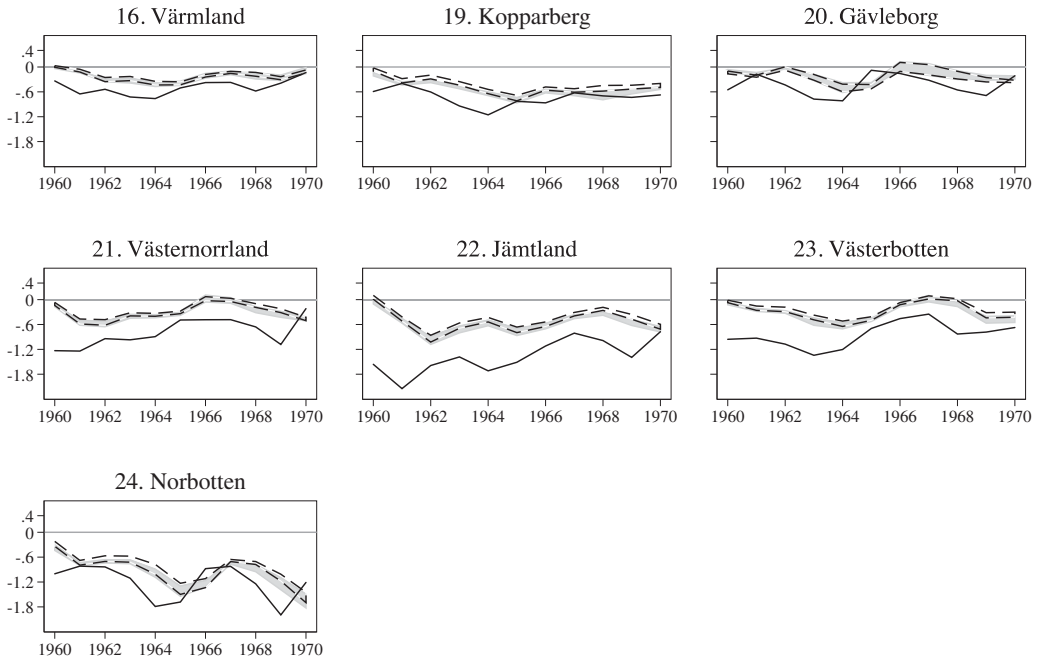

Figure 11. Actual and predicted net-migration from the northern counties during the 1960s.

Note: The figure shows the 95 % confidence intervals for the prediction of the net-migration rate for the northern counties during the 1960s. The light grey area shows the confidence interval for the model estimated on the 1955–75 sample period. The dashed lines shows the confidence interval for the model estimated on the 1965–85 sample period. The solid line shows the actual net-migration rate. The net-migration rate is given in percent.

In all cases, both models predict out-migration during the decade from all of the northern counties. The models seem to underpredict the actual out-migration to some extent, however, especially from the northernmost counties of Västernorrland, Jämtland and Västerbotten. Most importantly, nonetheless, the confidence intervals for the predictions for all counties and all years are very similar for both the models; they overlap for most years. Thus, the two models essentially predict the same level of out-migration from the northern counties in the 1960s.

Judging from this exercise, the heavy out-migration from the northern counties in the 1960s was, therefore, not the result of a higher responsiveness of interregional migration to a deviation in the vacancy rate. It is important to remember, however, that this only implies that the change in the migration response between the sample periods of 1955–1975 and 1965–1985 was not substantial enough to make any difference, in this respect. Judging from these results, the explanation of the decline in regional migration after 1970 must be sought in some factor other than the response of migration to local labour market conditions. Since the deviation in labour income was insignificant for all sample periods, this factor can likewise not explain these patterns.

5. Discussion and conclusion

In this article, I analysed interregional migration in Sweden throughout the postwar period from 1945 to 1985. This was made possible through the collection and creation of a unique dataset comprised of consistent net-migration rates, vacancy rates and income per employed at the county level. Over time, the rate of regional migration can be the result of two components: the responsiveness of migration to local labour market conditions and the distribution of those labour market conditions across space. By estimating the same net-migration equation

for three partly overlapping sample periods; 1945–1965, 1955–1975 and 1965–1985, I could compare the responsiveness of migration to the local vacancy rate and to labour income per employed during different time periods in Sweden.

The results indicate that labour income per employed has not been a statistically significant driver of migration for any sample period. In contrast, the vacancy rate has been a considerable driver of migration in all periods. There is, however, no statistically significant difference in the response of net-migration to the local vacancy rate either in the short- or long-term for any sample period. This conclusion also appears to be robust to the selection of cross-sections and time periods. However, this last assertion is limited by the problem with short time periods in cross-section time series analysis, especially when estimating long-run effects.

Taken together, the results give a new perspective on the decline in migration after 1970 in Sweden. My estimates suggest that differences in migration were mainly due to the factors affecting the geographical dispersion of labour demand, rather than a decline in the responsiveness of migration. I have illustrated this by showing that, given the large dispersion in the vacancy rates between the northern counties and the rest of the country during the 1960s, out-migration would have been just as prevalent, even with the migration response of the 1970s and early 1980s.

Previous authors have given different explanations for the high rate of interregional migration during the 1960s and for the subsequent decline in migration during the 1970s. Some explanations have put an emphasis on the tied-mover theory, arguing that the increase in female labour force participation, especially during the 1970s, contributed to the decline. My results indicate that the response of net-migration to local labour market conditions was almost identical for the 1945–1965 period as for the 1965–1985 period. Thus, social and demographic changes after 1970 cannot explain the migration response since it was of the same magnitude in the 1970s as it had been in the early postwar period, when such factors were not present. My results further seem to confirm Rehn and Meidner's view that regional migration is more responsive to the local labour demand than to relative income differences. Relative labour income was not a significant driver of net-migration in any sample period. Here, my results come close to Westerlund (1997) and others but differ from those of Gärtner (2014). This difference could be due to the different income concepts; Gärtner (2014) uses the manufacturing wage, while I use labour income per employed. It could also be due to the different datasets, as Gärtner (2014) uses gross flows between each county pair. Dribe (1994) and Bengtsson & Johansson (1993) have similarly argued that decreasing income differences contributed to the decline in migration. This argument is not supported by my results since regional income differences seem not to have been an important driver of migration, even for the period when income differences were very large. Thus, the secular decline in the income differences across counties during the postwar period, which could be seen clearly in Figure 4, does not seem to have affected migration rates.

Correspondingly, Bengtsson & Johansson (1993), Nilsson (1989), Lundholm (2007) and Dribe (1994) argue that policy changes, such as transfer payments and regional policy, contributed to the decline of the responsiveness of migration. Lundh (2006) has also argued that external mobility might have been limited by institutional changes such as the Employment Protection Act (Lagen om anställningsskydd: LAS). If government policies reduced the incentive to move, this should have been visible in a change to the responsiveness of migration to the local vacancy rate.

Finally, the results presented here suggest that to better understand the decline in interregional migration after 1970, the searchlight should be pointed at explanations of the characteristics of structural change and how it has affected regions diversely at different times. The Hoover-index, presented in Figure 5, showed that the 1960s stand out with an unprecedented rate of spatial concentration, while during the 1970s labour demand remained a great deal more stable across space. What can account for these trends? Answering that question is beyond the scope of this essay, but the tentative patterns presented here can give some indication. The essay has also highlighted, that in order to understand the decline in interregional migration during the

1970s, it is necessary to apply a long-run perspective that puts these processes in proper context.

Acknowledgements

I am grateful for comments and suggestions from Kerstin Enflo, Magnus Lindmark, Christer Lundh, Lars Magnusson and Jan Ottosson on earlier drafts of the manuscript. This paper has also benefited from comments by seminar participants at the Departments of Economic History at Uppsala and Lund University and the EHFF in Stockholm. I also want to thank the editor Professor Paul Sharp and two anonymous referees for insightful comments and criticism. Special thanks also go to Pasi Nevalainen for help with the submission process. All errors and misunderstandings are the responsibility of the author.

Disclosure statement

No potential conflict of interest was reported by the author.

Funding

This work was supported by Jan Wallanders och Tom Hedelius Stiftelse samt Tore Browaldhs Stiftelse [P2013-0274:1].

References

Alexopoulos, M., & Cohen, J. (2003). Centralised wage bargaining and structural change in Sweden. *European Review of Economic History*, *7*(3), 331–363.

Bäcklund, D. (1999). *Befolkningen och regionerna: ett fågelperspektiv på regional ekonomisk utveckling i Sverige från 1820 och framåt*. Technical report. Östersund: Institutet för regionalforskning (SIR).

Beck, N., & Katz, J. N. (2009). *Modeling dynamics in time-series-cross-section political economy data*. Technical Report. Division of the Humanities and Social Sciences. Pasadena, CA: California Institute of Technology.

Bengtsson, T., & Johansson, M. (1993). Economic and social factors behind the slow-down of migration in Northern Sweden. In H. Jussila, L. O. Persson, & U. Wiberg (Eds.), *Shifts in systems at the top of Europe* (pp. 33–47). Stockholm: FORA.

Blackburne, E. F., & Frank, M. W. (2007). Estimation of nonstationary heterogeneous panels. *Stata Journal*, *7*(2), 197–208.

Blanchard, O., & Katz, L. (1992). Regional evolutions. *Brookings Papers on Economic Activity*, *1992*(1), 1–75.

Borgegård, L.-E., Håkansson, J., & Malmberg, G. (1995). Population redistribution in Sweden: Long term trends and contemporary tendencies. *Geografiska Annaler. Series B, Human Geography*, *77*(1), 31–45.

Bruno, G. S. F. (2005). Approximating the bias of the LSDV estimator for dynamic unbalanced panel data models. *Economics Letters*, *87*(3), 361–366.

Dahlberg, Å., & Holmlund, B. (1978). The interaction of migration, income, and employment in Sweden. *Demography*, *15*(3), 259–266.

De Boef, S., & Keele, L. (2008). Taking time seriously. *American Journal of Political Science*, *52*(1), 184–200.

Decressin, J., & Fatás, A. (1995). Regional labor market dynamics in Europe. *European Economic Review*, *39*, 1627–1655.

Dribe, M. (1994). *Långväga flyttningar i Sverige 1961–1992: En studie av förändringarna i de interregionala flyttningarna för män i åldern 20-29 år*. Technical Report. Lund: Department of Economic History, Lund University.

Edin, P.-A., & Topel, R. (1997). Wage policy and restructuring: The Swedish labor market since 1960. In R. B. Freeman, R. Topel, & B. Swedenborg (Eds.), *The welfare state in transition: Reforming the Swedish model* (pp. 155–202). Chicago, IL: University of Chicago Press.

Eichengreen, B. (1993). Labor markets and European monetary unification. In P. R. Masson, & M. P. Taylor (Eds.), *Policy issues in the operation of currency unions* (chapter 6, pp. 130–162). Cambridge, MA: Cambridge University Press.

Enflo, K., Henning, M., & Schön, L. (2014). Swedish regional GDP 1855–2000: Estimations and general trends in the regional system. *Research in Economic History*, *30*, 47–89.

Enflo, K., & Rosés, J. R. (2015). Coping with regional inequality in Sweden: Structural change, migrations and policy, 1860–2000. *Economic History Review*, *68*(1), 191–217.

Erixon, L. (2010). The Rehn–Meidner model in Sweden: Its rise, challenges and survival. *Journal of Economic Issues*, *44*(3), 677–715.

Forslund, A., & Krueger, A. (1997). An evaluation of the Swedish active labor market policy: New and received wisdom. In R. B. Freeman, R. Topel, & B. Swedenborg (Eds.), *The welfare state in transition: Reforming the Swedish model* (pp. 267–298). Chicago, IL: University of Chicago Press.

Fredriksson, P. (1999). The dynamics of regional labor markets and active labor market policy: Swedish evidence. *Oxford Economic Papers*, *51*(4), 623–648.
Freeman, R. B., Topel, R., & Swedenborg, B. (1997). *The welfare state in transition: Reforming the Swedish model*. Chicago, IL: University of Chicago Press.
Gärtner, S. (2014). New macroeconomic evidence on internal migration in Sweden, 1967–2003. *Regional Studies*, 1–17. doi:10.1080/00343404.2014.899693
Hedenborg, A., & Meidner, R. (1984). *Folkhemsmodellen*. Stockholm: Rabén och Sjögren.
Henrekson, M., Jonung, L., & Stymne, J. (1996). Economic growth and the Swedish model. In N. Crafts, & G. Toniolo (Eds.), *Economic growth in Europe since 1945* (chapter 9, pp. 240–289). Cambridge: Cambridge University Press.
Kiviet, J. F. (1995). On bias, inconsistency, and efficiency of various estimators in dynamic panel data models. *Journal of Econometrics*, *68*(1), 53–78.
Krugman, P. (1993). Lessons of Massachusetts for EMU. In F. Torres, & F. Giavazzi (Eds.), *Adjustment and growth in the European monetary union* (chapter 8, pp. 241–261). Cambridge, MA: Cambridge University Press.
Lundh, C. (2006). Arbetskraftens rörlighet och arbetsmarknadens institutioner i Sverige 1850–2005. In D. Rauhut, & B. Falkenhall (Eds.), *Arbetsrätt, rörlighet och tillväxt* (chapter 2, pp. 17–62). Östersund: Institutet för tillväxtpolitiska studier (ITPS).
Lundholm, E. (2007). *New motives for migration? On interregional mobility in the nordic context*. Gerum – kulturgeografi 2007:2, Umeå University.
Lundholm, E. (2010). Interregional migration propensity and labour market size in Sweden, 1970–2001. *Regional Studies*, *44*(4), 455–464.
Moretti, E. (2011). Local labor markets. In O. Ashenfelter, & D. E. Card (Eds.), *Handbook of labor economics* (Vol. 4, pp. 1237–1313). Amsterdam: Elsevier.
Nelson, M., & Wyzan, M. (1989). Public policy, local labor demand, and migration in Sweden, 1979–84. *Journal of Regional Science*, *29*(2), 247–264.
Nickell, S. (1981). Biases in dynamic panel models with fixed effects. *Econometrica*, *49*(6), 1417–1426.
Nilsson, C. (1985). *Har arbetskraftens flyttningsbenägenhet minskat under det senaste decenniet - en kunskapsöversikt*. Technical report. Uppsala: Nationalekonomiska institutionen, Uppsala Universitet.
Nilsson, C. (1989). *Lönepolitik och regional balans: En ekonometrisk analys av de regionala arbetsmarknadsproblemen och den fackliga lönepolitiken under perioden 1964–83*. Technical report. Stockholm: Fackföreningsrörelsens institut för ekonomisk forskning (FIEF).
Nilsson, C. (1995). *Den interregionala omflyttningen i Sverige - Konsekvenser av arbetsmarknadsläge, arbetsmarknadspolitik och regionala levnadsomkostnader*. Technical report. Stockholm: EFA: Arbetsmarknadsdepartementet.
Olsson Spjut, F. (2010). *Beräkning av historisk BRP - Beräkning av bruttoregionprodukter 1968–1992: Beräkningsmetoder och data*. Technical Report 20 (CERUM Report Nr 20/2010).
Persson, J. (1997). Convergence across the Swedish counties, 1911–1993. *European Economic Review*, *41*, 1835–1852.
Pissarides, C. A., & McMaster, I. (1990). Regional migration, wages and unemployment: Empirical evidence and implications for policy. *Oxford Economic Papers*, *42*(4), 812–831.
Rehn, G. (1977). Finansministrarna, LO-ekonomerna och arbetsmarknadspolitiken. In B. Ohlin, J. Herlin, & L. Werin (Eds.), *Ekonomisk debatt och ekonomisk politik : Nationalekonomiska föreningen 100 år* (pp. 201–227). Lund: Nordstedt.
Svanlund, J. (2009). *Svensk och finsk upphinnartillväxt: Faktorpris- och produktivitetsutjämning mellan Finland och Sverige 1950–2000*. Umeå studies in economic history, Umeå University.
Swenson, P. A. (2002). *Capitalists against markets: The making of labor markets and welfare states in the United States and Sweden*. New York, NY: Oxford University Press.
Westerlund, O. (1997). Employment opportunities, wages and interregional migration in Sweden 1970–1989. *Journal of Regional Science*, *37*(1), 55–73.
Westerlund, O. (1998). Internal migration in Sweden: The effects of mobility grants and regional labour market conditions. *Labour*, *12*(2), 363–388.
Westerlund, O. (2001). Arbetslöshet, arbetsmarknadspolitik och geografisk rörlighet. *Ekonomisk Debatt*, *4*, 263–272.

Sources

Official Statistics of Sweden. 'Vital Statistics' (*SOS Befolkningsrörelsen*) 1945–1960.
Official Statistics of Sweden. 'Population Changes' (*SOS Folkmängdens förändringar*) 1961–1966.
Official Statistics of Sweden. 'Population Changes, part 3' (*Befolkningsförändringar, del 3*) 1967–1990.
Official Statistics of Sweden. 'Labor Force Survey' (*Arbetskraftsundersökningen*) 1970–1985.
The Royal Labor Market Board. 'Labor Market Statistics' (*Arbetsmarknadsstatistik*) 1963–1985.
The Royal Labor Market Board. 'Annual Audits' (*AMS årsredovisning*) 1945–1963.

Official Statistics of Sweden. 'Tax Assessments and the Distribution of Incomes and Wealth' (*Skattetaxeringarna samt fördelningen av inkomst och förmögenhet*) 1945–1969.

Official Statistics of Sweden. 'Tax Assessment Statistics' (*Taxeringsutfallet*) 1969–1985.

Appendix. Additional robustness checks

This appendix presents additional robustness checks in addition to those performed in Section 4.3. Table A1 and Figure A1 show the results of using the bias-corrected LSDV estimator (LSDVc). The estimation uses 100 iterations to bootstrap the standard errors and the Arellano-Bond estimator to initialise the bias correction. Table A2 and Figure A2 check if the results are robust to using the variables in levels instead of in deviation from the national yearly mean, as in the baseline model of Table 1. Additionally, Table A3 and Figure A3, likewise. enter the variables in levels but also adds time fixed effects.

Finally, Tables A4 and A5 test the effect of using income per capita instead of income per employed and of using vacancies over population instead of vacancies over the number of employed.

Table A1. Estimation using bias-corrected LSDV estimator (LSDVc).

		1945–1965	1955–1975	1965–1985
M_{t-1}	Lagged migration	0.698** (0.044)	0.679** (0.044)	0.736** (0.036)
dVR_t	Vacancy rate	0.005** (0.001)	0.008** (0.002)	0.005** (0.001)
dLI_t	Labor income	−0.008 (0.005)	−0.006 (0.006)	−0.004 (0.005)
Statistics				
Fixed effects		Yes	Yes	Yes
Observations		480	480	480

Note: The table shows the results from estimating the model in Equation (5) on the three sample periods 1945–1965, 1955–1975 and 1965–1975 with detrended variables as described in the text. M_{t-1} is county net-migration as share of mid-year population, lagged one year; dVR_t is the log of the vacancy rate (number of vacancies divided by employment) in the county less the log of the national vacancy rate. dLI_t is the log of labour income per employed in the county less the log of the national average labour income per employed. Standard errors in parenthesis, clustered at the county level. The estimation uses 100 iterations to bootstrap the standard errors and the Arellano-Bond estimator to initialise the bias correction. $^{*}p < 0.05$, $^{**}p < 0.01$.

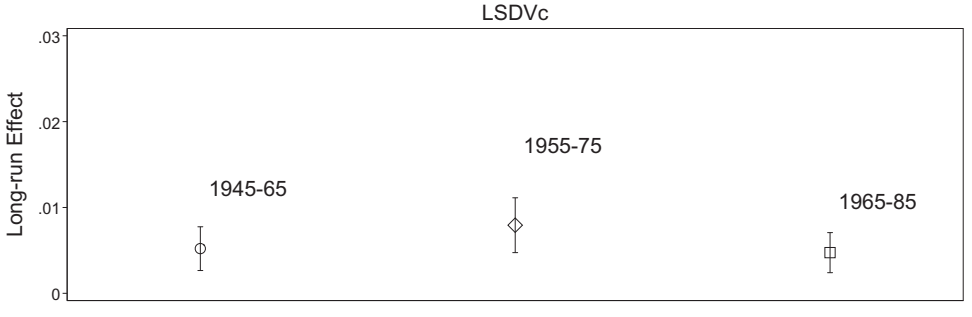

Figure A1. Point estimates and 95% confidence intervals for the three sample periods.

Note: The figure shows the point estimate for the effect of a deviation in the vacancy rate from the national average for each sample period alongside the 95% confidence interval. The point estimates are from estimating equation (5) on the three sample periods 1945–1965, 1955–1975 and 1965–1985 as in Table A1.

Table A2. Model with variables in levels.

		1945–1965	1955–1975	1965–1985
M_{t-1}	Lagged migration	0.609** (0.058)	0.642** (0.053)	0.686** (0.034)
VR_t	Vacancy rate	0.006** (0.001)	0.003* (0.001)	0.002* (0.001)
LI_t	Labor income	0.001 (0.002)	−0.002 (0.001)	−0.003* (0.001)
Statistics				
Fixed effects		Yes	Yes	Yes
Adjusted R^2		0.50	0.57	0.61
Observations		480	504	504
Tests (*p*-values)				
AC test (2 lags)		.09	.02	.06
FE F(df 3, 23)		0	0	0

Note: M_{t-1} is county net-migration as share of mid-year population, lagged one year; VR_t is the log of the vacancy rate (number of vacancies divided by employment) in the county. LI_t is the log of labour income per employed in the county. Standard errors in parenthesis, clustered at the county level. $^*p < 0.05$, $^{**}p < 0.01$.

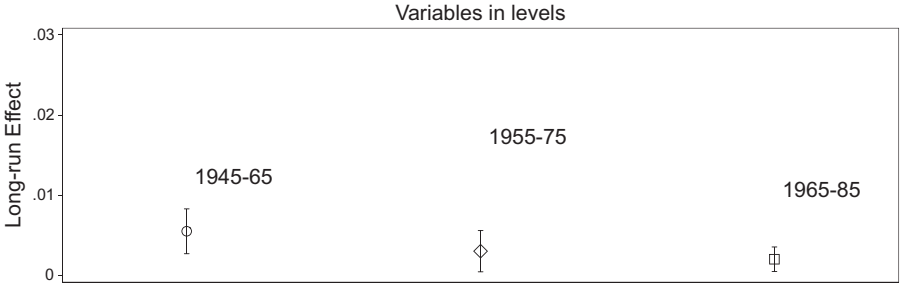

Figure A2. Point estimates and 95% confidence intervals for the three sample periods.

Note: The figure shows the point estimate for the effect of a deviation in the vacancy rate from the national average for each sample period alongside the 95% confidence interval. The point estimates are from estimating equation (5) on the three sample periods 1945–1965, 1955–1975 and 1965–1985 as in Table 1.

Table A3. Model with variables in levels, adding year fixed effects.

		1945–1965	1955–1975	1965–1985
M_{t-1}	Lagged migration	0.620** (0.063)	0.595** (0.042)	0.664** (0.037)
VR_t	Vacancy rate	0.006** (0.002)	0.009** (0.002)	0.005** (0.001)
LI_t	Labor income	−0.008 (0.009)	−0.006 (0.009)	−0.003 (0.006)
Statistics				
Fixed effects		Yes	Yes	Yes
Adjusted R^2		0.53	0.61	0.64
Observations		480	504	504
Tests (*p*-values)				
AC test (2 lags)		.21	.04	.08
FE F(df 3, 23)		0	0	0

Note: M_{t-1} is county net-migration as share of mid-year population, lagged one year; VR_t is the log of the vacancy rate (number of vacancies divided by employment) in the county. LI_t is the log of labour income per employed in the county. Standard errors in parenthesis, clustered at the county level. $^*p < 0.05$, $^{**}p < 0.01$.

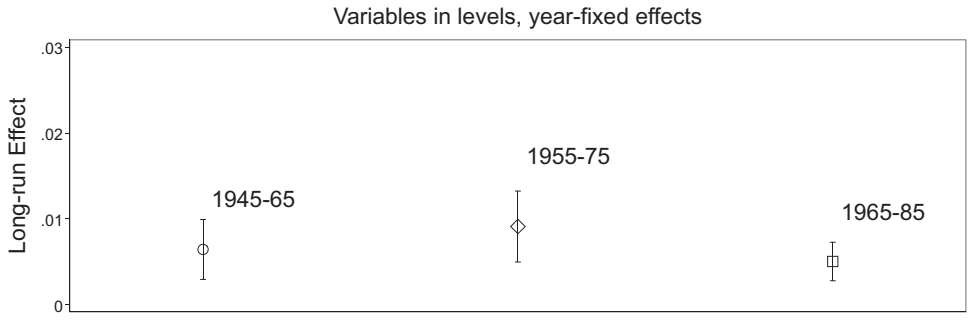

Figure A3. Point estimates and 95% confidence intervals for the three sample periods.

Note: The figure shows the point estimate for the effect of a deviation in the vacancy rate from the national average for each sample period alongside the 95% confidence interval. The point estimates are from estimating Equation (5) on the three sample periods 1945–1965, 1955–1975 and 1965–1985 as in Table 1.

Table A4. Model with income per capita instead of income per employed.

		1945–1965	1955–1975	1965–1985
M_{t-1}	Lagged migration	0.628** (0.057)	0.612** (0.043)	0.669** (0.033)
dVR_t	Vacancy rate	0.006** (0.002)	0.008** (0.002)	0.005** (0.001)
$dLIpc_t$	Labor income	−0.009 (0.006)	−0.012 (0.011)	0.001 (0.010)
Statistics				
Fixed effects		Yes	Yes	Yes
Adjusted R^2		0.50	0.59	0.61
Observations		480	504	504
Tests (*p*-values)				
AC test (2 lags)		.2	.07	.14
FE F(df 3, 23)		0	0	0

Note: The table shows the results from estimating the model in Equation (5) on the three sample periods 1945–1965, 1955–1975 and 1965–1975 with detrended variables as described in the text. M_{t-1} is county net-migration as share of mid-year population, lagged one year; dVR_t is the log of the vacancy rate (number of vacancies divided by employment) in the county less the log of the national vacancy rate. $dLIpc_t$ is the log of labour income per capita in the county less the log of the national average labour income per capita. Standard errors in parenthesis, clustered at the county level. $^{*}p < 0.0$,$^{**}p < 0.01$.

Table A5. Model with vacancies per capita instead of vacancies per employed.

		1945–1965	1955–1975	1965–1985
M_{t-1}	Lagged migration	0.617** (0.059)	0.598** (0.042)	0.666** (0.029)
$dVRpc_t$	Vacancy rate	0.006** (0.002)	0.008** (0.002)	0.005** (0.001)
dLI_t	Labor income	−0.006 (0.008)	−0.001 (0.007)	0.001 (0.006)
Statistics				
Fixed effects		Yes	Yes	Yes
Adjusted R^2		0.50	0.59	0.61
Observations		480	504	504
Tests (*p*-values)				
AC test (2 lags)		.14	.05	.13
FE F(df 3, 23)		0	0	0

Note: The table shows the results from estimating the model in Equation (5) on the three sample periods 1945–1965, 1955–1975 and 1965–1975 with detrended variables as described in the text. M_{t-1} is county net-migration as share of mid-year population, lagged one year; $dVpc_t$ is the log of vacancies per capita (number of vacancies divided by the population) in the county less the log of the national vacancies per capita. dLI_t is the log of labour income per capita in the county less the log of the national average labour income per capita. Standard errors in parenthesis, clustered at the county level. $^{*}p < 0.05$,$^{**}p < 0.01$.