

Occupational Change and Industrialization: from Russia to the Soviet Union (1897-1959)

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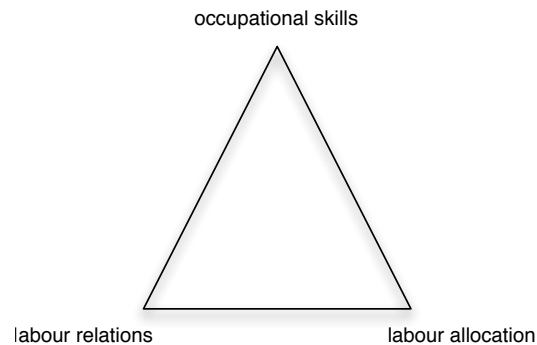
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Introduction

This paper investigates occupational change in Russia over a period witnessing two waves of industrialisation – late-nineteenth century capitalist industrial take-off and mid-twentieth century non-market Soviet industrialisation. We understand occupational change as a composite of change in three inter-related fields: human capital, labour relations, and labour allocation. With the term ‘human capital’ we refer to the skills of the labour force, both technical and organisational/managerial, with ‘labour relations’ to the social relations under which work is performed, both

hierarchical and non-hierarchical, and with labour allocation to the break-down of gainful employment by sector and/or branch. Changes in the one field will usually involve changes in one of the other two as well, but this is not a straightforward relationship, and change can come in many different combinations. Schematically, this interrelationship can be rendered as follows (cf. figure 1):

Figure 1: Occupational change as a composite process



Let us look at this in some more detail. Changes in labour allocation usually lead the way, driven by changes in production decisions in the economy at large. Best example here is the transfer of labour out of agriculture into manufacturing usually associated with industrialisation processes. But changes in patterns of labour allocation can also follow shifts in labour relations, or a skilling or deskilling of the workforce.

Starting with the former, a few more words are in order concerning our definition of labour relations. Most often associated with the term are hierarchical employer-worker relations, or 'vertical' labour relations, but the variety of labour relations under which work is performed, is much larger. To start with, it includes other vertical relations of a hierarchical nature, notably tributary, slavery and other forms of unfree labour relations. Secondly, it includes what we call 'horizontal' labour relations, i.e. non-hierarchical relations between workers engaged in one production process. Labour relations regulate the way in which the labour involved in a production process is organised, the quality of output is monitored, and the way in which the collaboration between workers is coordinated and, where applicable, supervised. Self-employment and family labour are just as much part of this field as employment and slavery.¹

Shifts in labour relations are often related to shifts in production decisions, like the change from artisanal to factory production, but can also occur because of other reasons, like the abolition of slavery or the imposition of limitations on private enterprise, yet translate into shifts in labour allocation between sectors or the development/suppression of certain occupational skills.

Along similar lines, education, the immigration of people with certain skills or technological innovation can act as a catalyst for changes in labour relations and or labour allocation.

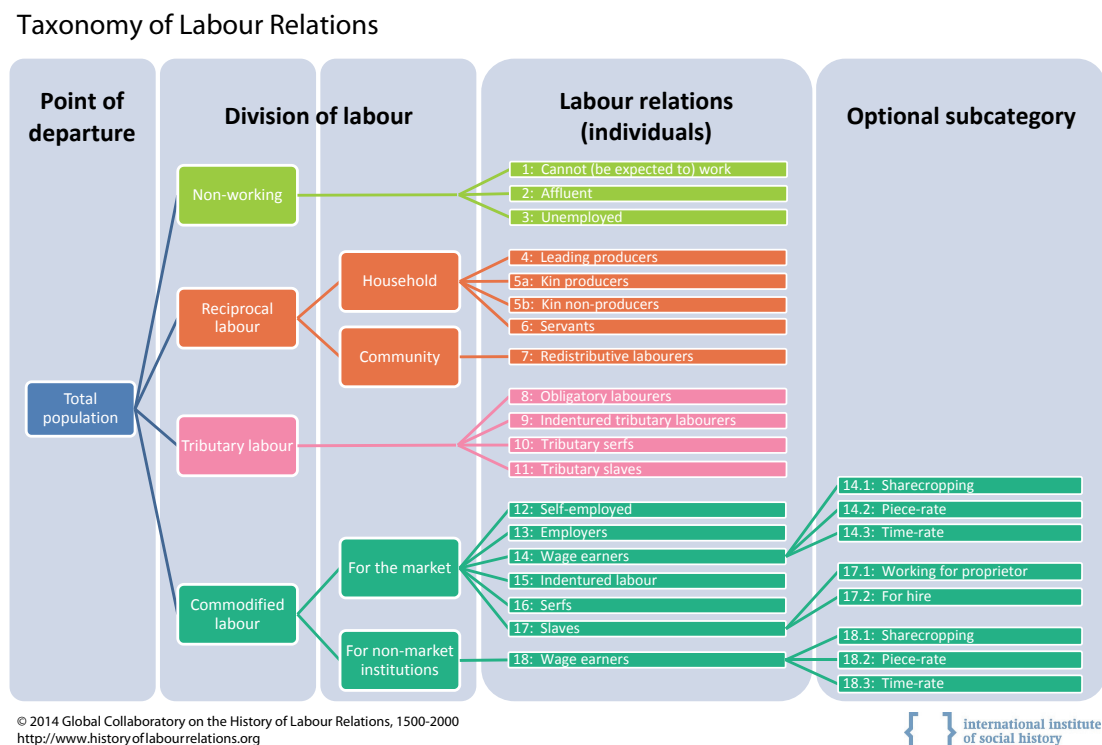
Ultimately, therefore, the three fields of investigation outlined above correspond to different perspectives on the process of occupational change, each with its own measurement techniques and

1. Definition elaborated at the International Institute of Social History, Amsterdam, The Netherlands within the research program on Global Labour History, and implemented in a number of projects, among which the Global Collaboratory on the History of Labour Relations in the period 1500-2000, cf. <http://socialhistory.org/en/projects/history-labour-relations-1500-2000>

data requirements. Foremost among these measuring techniques in all three fields is the reliance on a unified system of categories for grouping and ordering one's data, so as to be able to compare over time and across space.

A taxonomy of labour relations has recently been developed for such purposes by the Global Collaboratory for the History of Labour Relations, an initiative of the International Institute of Social History sponsored by the Gerda Henkel Stiftung and the Netherlands Organisation for Scientific Research.² It distinguishes between eighteen possible labour relations, ranging from non-working to wage labour, which together encompass the entire population of a given territory (cf. figure 2).

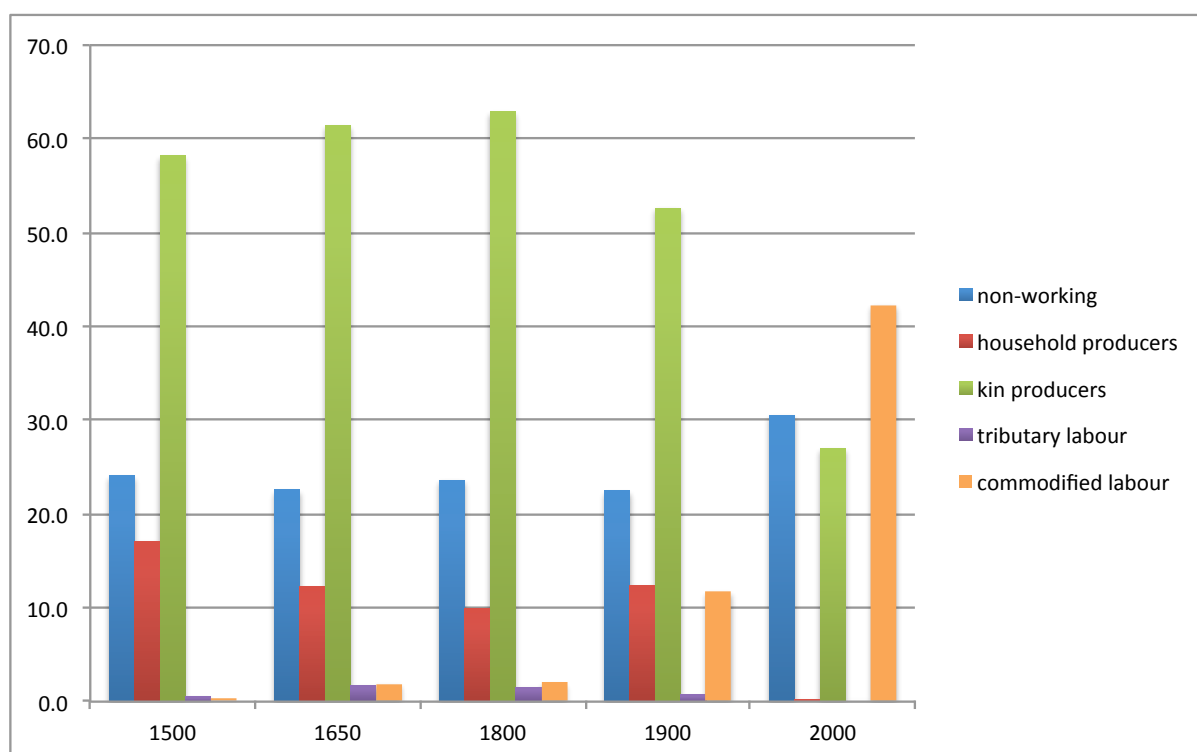
Figure 2: Taxonomy Global Labour Relations



As shown in figure 2, the taxonomy groups labour relations into four larger clusters characterising the division of labour in a society between the non-working, reciprocal labour, tributary labour and commodified labour. Within the framework of the Collaboratory vast amounts of data have been gathered mapping these labour relations for most parts of the world at five historical cross-sections (1500, 1650, 1800, 1900, 2000). For Russia, a first attempt at a line-up of the data for these five benchmark-years has been presented elsewhere, and is provided below for information.

2. <https://collab.iisg.nl/web/labourrelations/>

Chart 1: Labour Relations in Russia, 1500–2000 (% of total population)³



Three trends stand out from this graph - the gradual increase of commodified labour after 1800, the increase of the percentage of non-working people after 1900 and, finally, the decline of family labour and household work after a high around 1800 to less than half this value by 2000. Together, these trends show the transformation from a predominantly peasant country up till 1900 to a (post)-industrial society around 2000.

A system of classification for measuring occupational change from a perspective of skill and human capital is HISCO - an adaptation of the ILO classification ISCO68 (International Standard Classification of Occupations) to the needs of historical research.⁴ HISCO distinguishes between 9 major groups, 76 'minor' groups, 296 'unit' groups and 1675 'micro' groups with a coding-system allowing for the progressive refinement of one's classification by adding further detail. HISCO has become something of a standard in historical research on occupational change, but it has two, related, drawbacks. First, it requires 'pure' occupational titles at the input-side, which is a type of data that is not so often available if one does not have primary records. Among aggregate data-sets only modern population censuses tend to offer such data. Much more common instead, are data on employment by sector, but these cannot really be fruitfully coded in HISCO, because people working

3. Kessler, G.C. & Khitrov, Dmitrii (2012). "Transitions in Labour Relations in Eastern Europe: Russia, 1500 - 2000". Ninth European Social Science History conference (ESSHC): Glasgow (2012, April 14 - 2012, April 14).

4. History of Work Information System, <http://historyofwork.iisg.nl/> [as retrieved on 8 April 2014]

in one and the same sector ought to be divided between HISCO's major groups on the basis of their skills.

But even if one were able to somehow split such data by skill-groups, the drawback of HISCO from the analytical point of view is that it cannot reveal anything on sectoral change in employment. A system of classification which does allow one to monitor sectoral change is the Primary-Secondary-Tertiary system (PST) developed by the Cambridge Group for the History of Population and Social Structure.⁵ It offers a coding scheme which allows one to combine information on occupation and on sector and therefore to measure both occupational and sectoral change, provided of course that the data offer the required level of detail.

In this paper we measure occupational change in Russia between 1897 and 1959 using the PST classification. This is a purely pragmatical choice - our data for 1897 are sectoral rather than occupational, and although for 1959 we could use HISCO, it would preclude a comparison over time. Using PST, however, we can compare sectoral shifts over time and still add on the occupational information for 1959.

Data

The data-sets used in this paper have been gathered and compiled by the authors for inclusion into the Electronic Repository for Russian Historical Statistics (ERRHS).⁶ They are based on the 1897 and 1959 population censuses of, respectively, the Russian Empire and the Soviet Union. ERRHS offers data with a regional, province-level (*guberniia/oblast'*) breakdown for the territory of the current Russian Federation in two sets – in 'historical categories' as contained in the source they were drawn from, and coded using modern classification schemes, comparable over time and across space. This paper is based on the first results of the coding of the data on labour in the repository in PST and serves the simultaneous aim of establishing whether PST is the right choice of classification system for these data.

As said above, the 1897 census essentially offers only sectoral data, whereas the 1959 population census contains elaborate occupational data. What is more, the categorisation of the 1959 data is such that it also largely allows one to identify the sectoral breakdown of the workforce.

Both censuses offer a great level of detail. The 1897 census distinguishes 65 major groups and over 500 subcategories. Not all these categories are strictly sectoral - some are to all ends and purposes occupational categories, whereas others refer in first instance to specific labour relations, such as self-employment, entrepreneurship or living off rentier-income.

The 1959 census offers skill-based occupational categories, which could equally well be coded in HISCO, but groups them largely by sector, offering the same sort of two-thronged approach internal to PST.

5. <http://www.geog.cam.ac.uk/research/projects/occupations/britain19c/pst.html> [as retrieved on 8 April 2014]

6. G. Kessler & A. Markevich, Electronic Repository for Russian Historical Statistics (2014). The Electronic Repository for Russian Historical Statistics is a work-in-progress of the Interdisciplinary Centre for Studies in History, Economy and Society (ICSHES), the New Economic School (NES) and the International Institute of Social History (IISH). It will become publicly available by the autumn of 2014. For more information, cf. <https://collab.iisg.nl/web/electronic-repository-of-russian-historical-statistics/>

For the purpose of this paper we have limited ourselves to a coding of the data at the first two hierarchical levels of PST: 'sector' and 'group', which allows for a comparison of occupational change over time for 8 sectors and 130 groups. At the next hierarchical level it is possible to add a further sectoral breakdown into 418 different 'sections'. Finally, for 1959 the coding can also be extended to include occupation, which will be part of the eventual data-set in the Repository, allowing for comparison with modern data, as well with similar data for other countries.

Comparisons

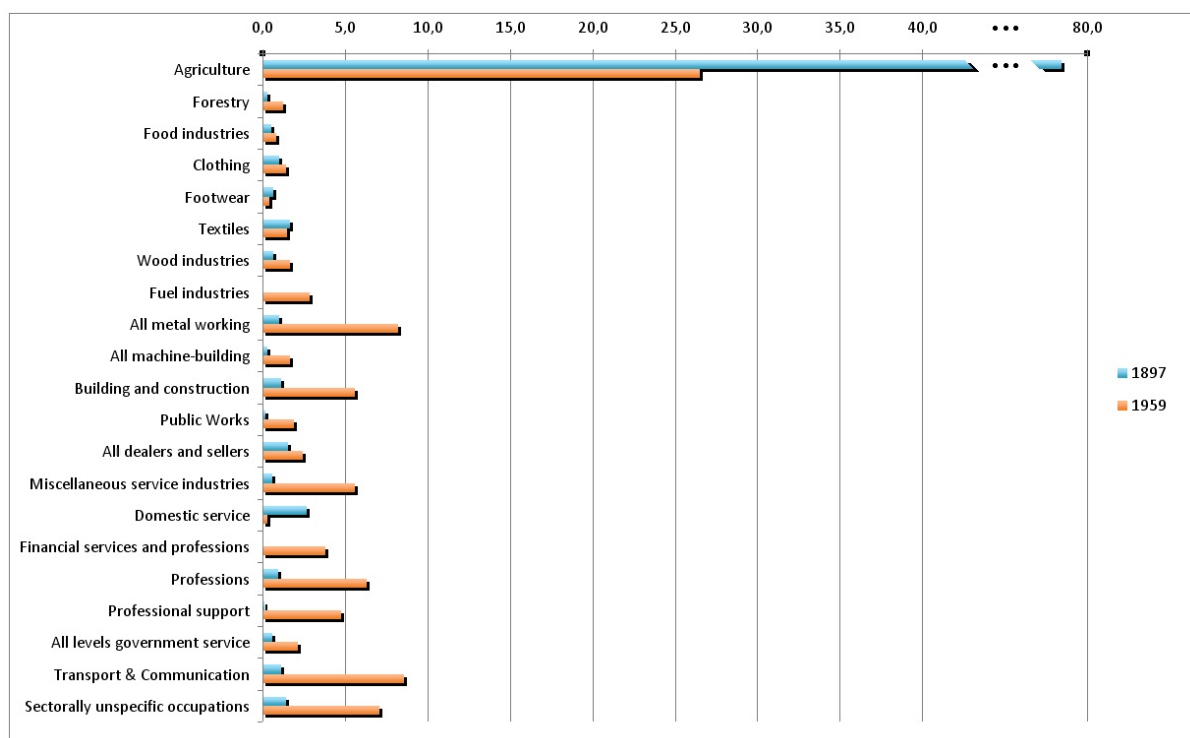
In the paragraphs below we have highlighted some of the most significant changes over time. First, we look into sectoral change, both for the country as a whole and in terms of regional differentiation for agriculture, manufacturing and transport & communication. Secondly, we look at sectoral change from a gender perspective, examining changes in female labour participation rates and sectoral shifts in gendered choices of employment.

Sectoral change, 1897–1959

National shifts

The 1897 and 1959 population censuses allow us to identify 103 out of the full PST range of 130 'groups'. Not for all of these groups neatly separated data are available - some of them are indistinguishable from each other in either the 1897 or 1959 dataset, or both and are therefore listed as combined 'groups', with the two group names listed sequentially, connected with the & sign. Most groups account for only a tiny fraction of total employment. For this reason we will focus on trends for a selection of groups – those accounting for more than 1% of the total gainfully employed population in either 1897, 1959 or both. Some of these are composite categories, consisting of the sum of several closely related PST-groups (All metal working, all machine-building, all dealers and sellers, all levels government service, transport & communication). Chart 2 shows the trends over time for the 22 categories involved.

Chart 2: Sectoral shifts in employment, Russia 1897–1959 (>1% of gainfully employed population)



Source: Calculated by authors from G. Kessler & A. Markevich, *Electronic Repository for Russian Historical Statistics* (2014), <http://ristat.org/>; *Pervaja vseobschaia perepis' naseleniia Rossiiskoi imperii 28 ianvaria 1897 goda*, 86 vols. (St. Petersburg, 1905); *Obshchii svod po imperii rezul'tatov razrabotki dannykh pervoi vseobshchei perepisi naseleniia, proizvedennoi 28 ianvaria 1897 goda*, 2 vols. (St. Petersburg, 1905).

This is a bit of an awkward chart, because of the need to accommodate values falling into two, quite different ranges. Both in 1897 and in 1959 agriculture is by far the largest sector of employment, even if its share is slashed by almost two-thirds over the sixty-year period under study, from 78.4% to 26.5%. This move out of agriculture fuelled the rise of other groups, none of which, however, by 1959 even comes near to agriculture yet in terms of its share of gainful employment. At the end of two successive waves of intense industrial development this comes as something of a surprise.

A few words are in order here concerning the data on agricultural employment. Whereas for 1959 they are fairly unproblematic, the 1897 census data severely under-register employment in agriculture, particularly among women.⁷ We do not, unfortunately, know for sure how the 1897 census-takers registered those employed in agriculture, but most likely they only counted those employed in agriculture as a main, full-time profession, leaving aside the female and male members of the peasant household who assisted the head of household in the work on the farm. To correct for

7. This conclusion we reached in an earlier version of this paper, presented at the European Social Science History Conference in Vienna, 23-26 April 2014.

this under-registration we have adjusted the 1897 data. Our method of adjustment relies on the data in the census specifying the number of people dependant on those registered with a main occupation in agriculture. Of these dependents we have added those between 15 and 70 years of age to the number of people registered as employed in agriculture. Our argument for doing so is that in the peasant household economy of that time all members of the household of working age would have been contributing to the work of the household to the one or the other extent. Our way of correcting the 1897 data does therefore mean that a large part of the outflow from agriculture between 1897 and 1959 consists of the shift of these underemployed kin-producers to other sectors of the economy.

If we consider in some more detail the changes in employment in the other sectors, the main trends are (1) the rise of heavy industry, in particular metal-working and, although much less so, machine-building, (2) an increase of employment in transport and communication, in (3) various branches of construction, and (4) a significant increase of employment in services.

The increasing importance of heavy industry is a finding entirely in line with what we know of the priorities in Stalinist and Soviet industrial development, which aimed to build up an industrial basis for further autarkic economic development. Indeed, the shares of metal-working and machine-building are in fact perhaps smaller than one would have expected given the sustained development of heavy industry since at least 1929.

A similar increase of employment took place in transport and communication, accounting for 1.1% of the workforce in 1897 and 8.5% in 1959. On the one hand this reflects general, worldwide increases in this sector, due to technological change and increased mobility. But in the Soviet case it is likely also a corollary to the industrial and agricultural development of many remote parts of the country starting from the 1930s. In the section on regional shifts below we will try and establish whether any shifts in the regional distribution of this workforce can be observed.

Construction is represented in Chart 2 by two categories - 'building and construction' and 'public works' - the latter of which refers to infrastructural development. Both groups significantly increased their share in total employment, equalling total employment in heavy industry when taken together. This points to the fact that the structure of the workforce in 1959 very much reflects a process of industrial development which is still in full swing.

Most impressive, however, in terms of the numbers of people involved, is the rise of the service sector. To be sure, in the soviet state-run economy this does not reflect the rise of a private service sector, but the expansion of the state apparatus. The 'professions' in the group of that name are doctors, teachers, engineers and scientists, all of whom would be state-employed in the 1959 Soviet Union. The auxiliary workers assisting these qualified professionals are in the 'professional support'-group. Financial services and professions could by definition exist only within the state-sector of the economy in the Soviet Union and it is in this category that we find the planners, state bankers and accountants of the command-administrative economy. Indeed, what is remarkable is that actual government service accounts for only a relatively modest share of the workforce (2.1%), and does not show the sort of rapid increase one would have imagined considering the fundamentally different role of the state in all walks of life respective to 1897.

The increase in the categories 'miscellaneous service industries' finally, is directly related to the demise of the category 'domestic service' – many of the personal services in this category would in 1897 have been tended for by Russia's small army of domestic servants, many of whom were of peasant origin.⁸ Although not strictly forbidden, the hiring of domestic workers in the 1959 Soviet

8. Cf. Engel, Barbara Alpern, *Between the fields and the city: women, work and family in Russia 1861-1914*

Union was much more of an informal arrangement, often with elderly women having fled the collectivisation of agriculture in the pre-war Soviet Union, and would most likely rarely have been listed in the population census as a profession. But even if they would have been included, the total numbers involved would probably still have been much lower than before the revolution, when the wealthy classes employed domestic labour on a large scale.

Finally, this brings us to the groups which witnessed little or no increase of their share in employment between 1897 and 1959 – light industry and trade.

For all branches of light industry which made it into Chart 2 (food industries, clothing, textile and footwear), the share of gainful employment hardly increased, or even slightly declined (textiles). Indeed, if anything, the decline was likely much more pronounced than Chart 2 suggests, because of the different production structure for consumer goods at the two cross-sections. In 1897 the larger part of clothes, foodstuffs, footwear and other consumer goods would have been home-produced by the peasant household, and the people engaged in this production would have ended up in the category 'agriculture' by their main occupation. In 1959, to the contrary, the much more urbanised Soviet population would have relied to a much larger extent on industrially produced consumer goods, although a significant part of food consumed was grown on small subsidiary garden plots, and clothes were largely home-produced even in urban households until the 1970s-80s.⁹

It is of course tempting to interpret this decline of employment in light industry as the consequence of the emphasis on the development of heavy industry in Soviet industrial development and as symptomatic for the extent to which Soviet society at the end of Stalinist industrialisation was a society characterised by shortages and repressed consumption. However, this might be too quick a conclusion, because the decline of the share of the workforce engaged in the production of consumer goods is most likely also partly due to mechanisation and other increases in labour productivity. Nevertheless, considering similar increases in productivity also took place in heavy industry, which did register an increase in its share of total employment, the stable share of the workforce engaged in light industry clearly brings out the priorities of the Soviet economic model.

Along similar lines, trade registered a modest increase in its share of the workforce, from 1.5% in 1897 to 2.4% in 1959. Given the increased complexity of the economy and, particularly, the move out of self-sufficiency of most of the rural population, this increase is of course very modest indeed. This is perhaps the most vivid illustration of the non-capitalist nature of the Soviet economic model, in which wholesale trade had been replaced by administrative allocation of resources, and retail trade remained underdeveloped in sync with the low priority of consumer goods production.

One of the stated aims of PST is to code data on occupational change in such a way that shifts between the main sectors of the economy can be measured, because it are these shifts in the balance between primary, secondary and tertiary sectors which are considered to be indicative of change along the path of economic development, and as such key to understanding changes in professional skills and human capital.¹⁰ It is for this purpose that in its first digit PST distinguishes six

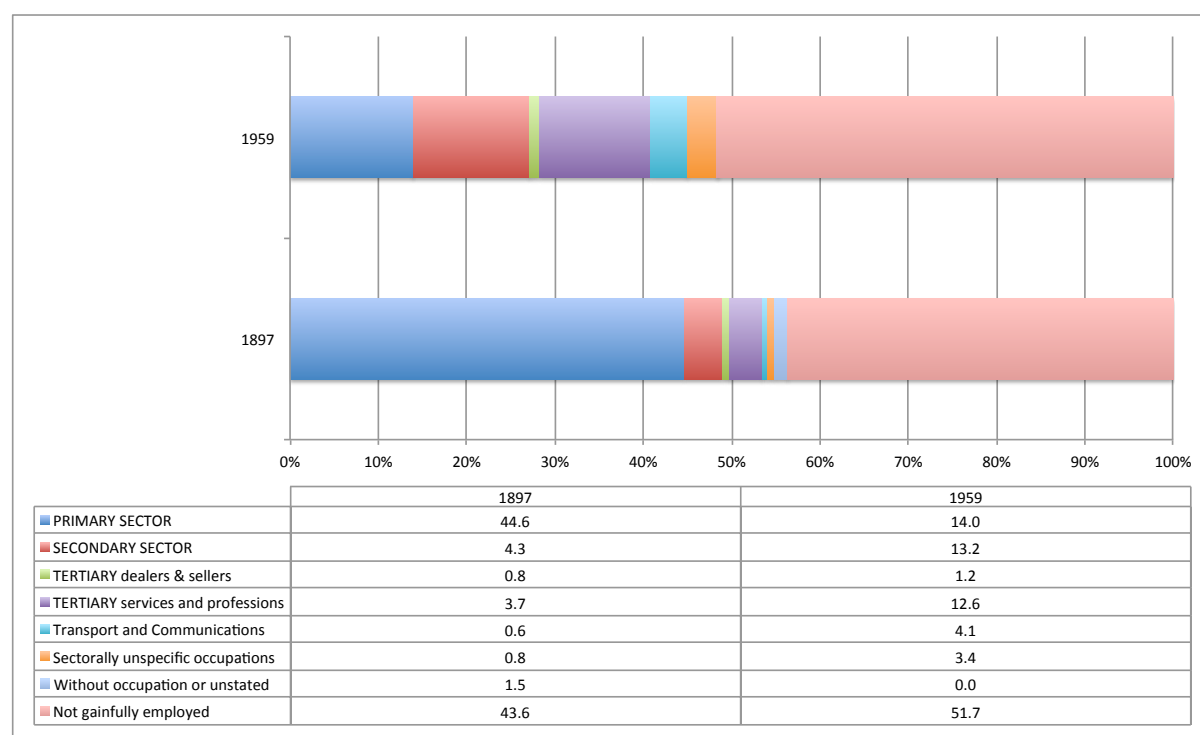
(Cambridge and New York, 1994)

9. Markevich, Andrei, "Finding Additional Income. Subsidiary Agriculture of Soviet Urban Households, 1941-1964", in Donald Filtzer, Wendy Goldman, Gijs Kessler and Simon Pirani (eds), *A Dream Deferred: New Studies in Russian and Soviet Labour History*, International and Comparative Social History 11 (Bern, Switzerland ; New York, 2008), pp. 385-415; Tyazhelnikova, Victoria, "The value of domestic labour in Russia, 1965-186", *Continuity and Change*, 21(1) (2006), pp. 159-193.
10. E.A. Wrigley, "The PST system of classifying occupations" [<http://www.geog.cam.ac.uk/research/>

sectors (primary, secondary, tertiary dealers, tertiary sellers, tertiary services and professions, transport and communications) and two additional categories (sectorally unspecific occupations, without occupation or unstated).

Chart 3 presents these data, expressed not as percentages of the workforce, but as percentages of the total population. The reason why we have chosen to deflate by the population as a whole, despite the distortions brought forth by differences in the demographic structure, is that it allows to take on board shifting ratios between the gainfully employed and the non-working in society, and therefore offers a more comprehensive picture (cf. the section on labour relations above).

Chart 3: Workforce by sector, Russia 1897–1959 (% of total population)



Source: Calculated by authors from G. Kessler & A. Markevich, *Electronic Repository for Russian Historical Statistics* (2014), <http://ristat.org/>; *Pervaia vseobschaia perepis' naseleniia Rossiiskoi imperii 28 ianvaria 1897 goda*, 86 vols. (St. Petersburg, 1905); *Obshchii svod po imperii rezul'tatov razrabotki dannykh pervoi vseobshchei perepisi naseleniia, proizvedennoi 28 ianvaria 1897 goda*, 2 vols. (St. Petersburg, 1905).

As we can see, however, levels of gainful employment did not differ widely between 1897 and 1959, decreasing from 56.4% to 48.3% of the population. The decrease likely primarily reflects the changes in the age-structure of the gainfully employed population, which due to the introduction of obligatory schooling and a pension system in the Soviet period falls entirely into the age-bracket 16-59, meaning that an a-priori larger share of the population is not expected to seek gainful

employment. Considering this, the similar percentage shares of gainful employment in 1897 and 1959 testify to impressive labour participation rates for the adult population in the 1959 Soviet Union, roughly on a par with those in the 1897 self-sufficient peasant society, where all able-bodied people participated in the work of the farm to the one or the other extent. More simply said, this finding means that in the 1959 much more urbanised and industrial Soviet Union practically all people of working-age were employed. The Soviet goal of full employment had been largely reached.¹¹

Compared to chart 2 the increase of the secondary and tertiary sectors appears as much more pronounced, accounting roughly for equal shares of the total 1959 population, on a par with agriculture.

Before we proceed to the analysis of regional patterns in sectoral employment, there is one thing which needs to be addressed and borne in mind when looking at all these graphs. The census data they are based on, only relate to main employment - all forms of by-employment are left out of the picture, as we saw, for example, in the discussion on the data on employment in the food industry, which leaves the home-production of foodstuffs, sizeable in both 1897 and 1959, unaccounted for. Many other such examples could be given. The problem is particularly acute for the year 1897, when most labour was embedded in the peasant household, an economic unit which relies almost by default on the combination of multiple economic activities around a core of smallholder farming.¹² Some of these side-activities would, for the purpose of this article, relate to the primary sector as well, such as wage labour in agriculture, hunting & gathering, but others, like cottage-industry, carting & hauling, and wage labour outside agriculture should essentially be classified as belonging to the secondary or even tertiary sectors.

The issue is a well-known problem in Russian labour historiography. Up till at least the 1930s large sectors of the urban and industrial economy relied on peasant migrant labourers, so-called *otkhodniki*, who had a base in agriculture and supplemented their income from farming with wage-work in industry.¹³ Some of these were working in industry for years in a row, but retained formal ties to the agricultural sector. Others worked in strictly seasonal branches of industry and trade, like construction, brick-making, and river-transport.

Ideally, such peasant-workers should be redistributed between sectors according to the number of months they worked in their respective trades, but this would require much more refined data than are currently available. Therefore we have no choice but to limit ourselves to occupation as registered at the time of the census. The census was held in the month of January, and this means that peasants who were working in industry on a more or less permanent basis would have been counted as employed in the secondary sector, whereas those who worked in the seasonal trades (which operated in spring, summer and early autumn) would have been registered as employed in agriculture at their home village. To some extent, therefore, the charts underestimate the size of employment outside agriculture.

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11. Cf. Markevich, Andrei, "Soviet urban households and the road to universal employment, from the end of the 1930s to the end of the 1960s", *Continuity and Change*, 20(3) (2005), pp. 443-473.
 12. Kessler, Gijs, "Wage Labor and the Household Economy: a Russian Perspective, 1600-2000", in Marcel Van der Linden and Leo Lucassen (eds), *Working on Labor. Essays in Honor of Jan Lucassen*, Studies in Global Social History, 9 (Leiden [etc.], 2012), pp. 353-369.
 13. Kessler, Gijs, "The Rural-Urban Nexus in Russian Labour History, 1860s-1930s: Suggestions for a Global, Comparative Perspective", in Marcel Van der Linden and Prabhu P. Mohapatra (eds), *Labour matters: towards global histories. Studies in honour of Sabyasachi Bhattacharya* (New Delhi, 2009), pp. 207-225.

Regional shifts

One of the central features of the Electronic Repository of Russian Historical Statistics, where the data used for this paper have been compiled for, is that it provides a regional breakdown for all the data it contains for each of its five benchmark years. In the Figures 3-8 the geographical distribution of sectoral employment is presented for three of the first-digit sectors of PST – the primary sector, the secondary sector and transport & communication. The values plotted in these maps are weighted figures, calculated as the share of a particular region in the total workforce for these respective sectors, divided by the share of the particular region in total population. If a region is represented among the workforce in this sector entirely proportional to its share in the total population this coefficient equals 1. Consequently, a value lower than 1 means employment in the sector concerned is lower than one would expect given the population size of the region, and a value higher than 1 means that employment in this sector has an above average significance in the region concerned.

The figures 3 and 4 focus on the single most important group in both 1897 and 1959 – the primary sector. It is the decline of the primary sector which fuels the growth in all other sectors, and therefore we wanted to find out whether this was a universal process, or that some regions experienced a more rapid outflow from agriculture than others. The maps show the entire territory of the Russian state in these two years, but data are available only for those regions falling within the boundaries of the modern-day Russian Federation – these are the coloured regions. Regions in white, to the contrary, fall outside of the boundaries of the modern Russian state.¹⁴

14. To ensure the comparability of data over time we have excluded two regions which are part of the current Russian Federation, but were not part of the Russian Empire in 1897 – Tuva and the Kaliningrad province.

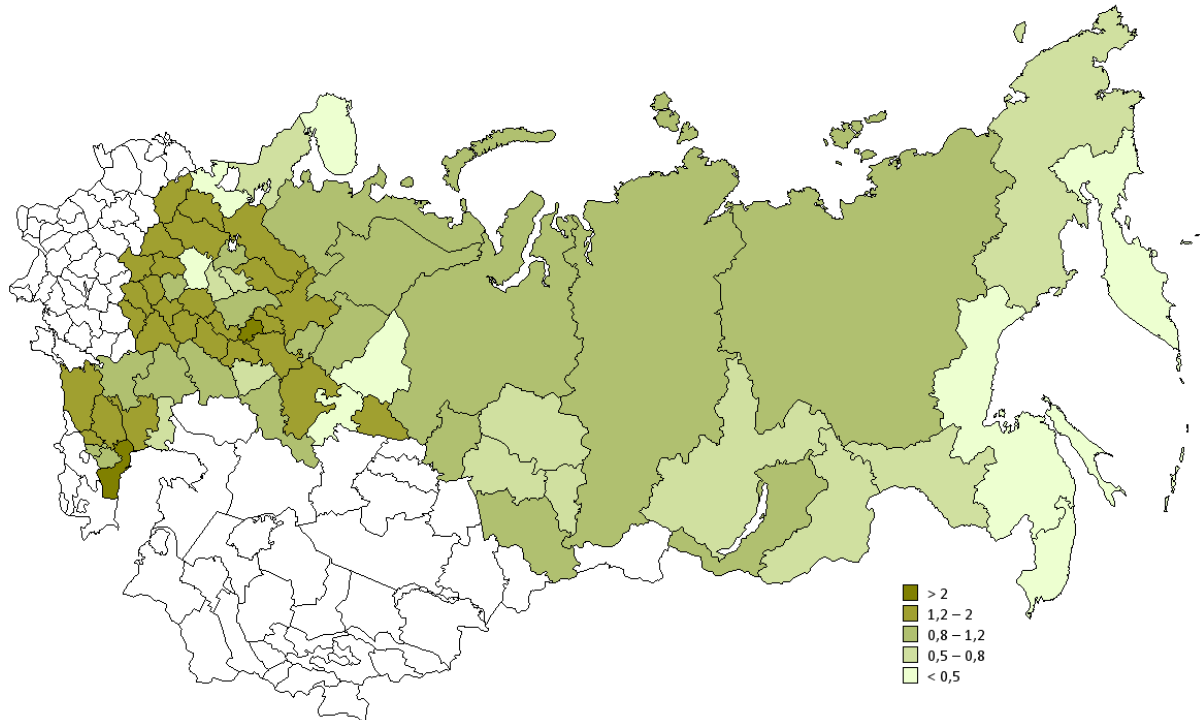
Figure 3: Primary sector employment by region – Russia, 1897 (share of total workforce accounted for by region weighed against population size)



Source: Calculated by authors from G. Kessler & A. Markevich, Electronic Repository for Russian Historical Statistics (2014), <http://ristat.org/>; *Pervaia vseobschaia perepis' naseleniia Rossiiskoi imperii 28 ianvaria 1897 goda*, 86 vols. (St. Petersburg, 1905); *Obshchii svod po imperii rezul'tatov razrabotki dannykh pervoi vseobshchei perepisi naseleniia, proizvedennoi 28 ianvaria 1897 goda*, 2 vols. (St. Petersburg, 1905).

The 1897 map for primary sector employment conforms to what one would expect, considering the fact that in most regions the overwhelming part of the population was engaged in agriculture. Almost all regions show a value of around 1, meaning that they contribute to overall employment in this sector proportional to their share in total population. The only outliers are the Russian Far East and the Vladimir province east of Moscow, which show employment in agriculture lower than one would expect (0.5 - 0.8), as well as the Moscow and St. Petersburg provinces, where primary sector employment is less than half of its share in total population. For the Moscow, St. Petersburg and Vladimir regions, which were home to significant industries and trades, this result is not difficult to explain - for the Russian Far East it is more surprising, given the fact that these were among the target areas for agricultural resettlement from the Russian heartland, but results might be less robust here due to very low overall population size.

Figure 4: Primary sector employment by region – Russia, 1959 (% of total workforce accounted for by region, weighed against population size)



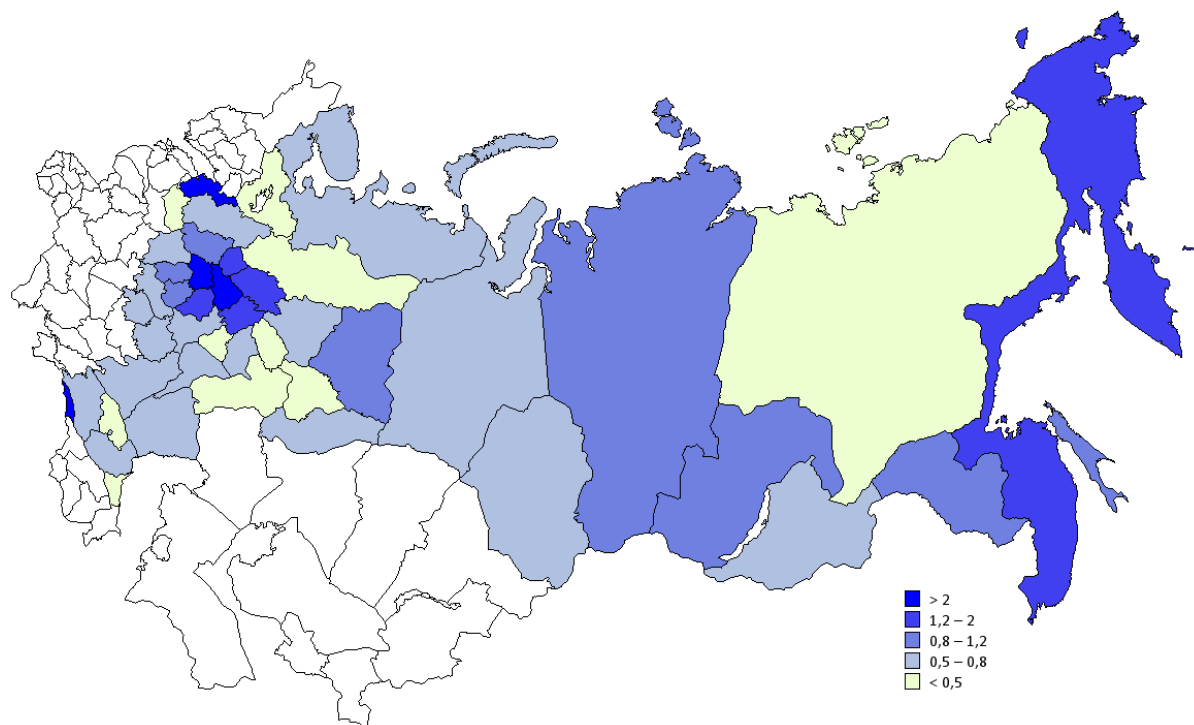
Source: Calculated by authors from G. Kessler & A. Markevich, Electronic Repository for Russian Historical Statistics (2014), <http://ristat.org/>

By 1959 we have a completely different picture. Primary sector employment is clearly concentrated in certain areas, almost all located in European Russia – the fertile steppe areas of the North Caucasus in the south, the traditional agricultural heartland of Russia in the Black-Earth zones south of Moscow and along the Volga river, the less fertile region between Moscow and St. Petersburg, where animal husbandry was practised, and two regions in the foothills of the Southern Urals (the Bashkir ASSR to the west and the Kurganskaya oblast to the east). Without any doubt this distribution closely reflects the prospects for agriculture as determined by geography and climate, and is therefore indicative of a process of regional specialisation in agriculture.

In all other regions primary sector employment is either proportional to its population or lower. The fact that still a substantial number of regions in areas of the country not primarily suitable for agriculture exhibit primary sector employment proportional to their population suggest that employment in agriculture still is the default economic behaviour for large parts of the country, and this helps explain the still surprisingly high overall share of primary sector employment in 1959 which we saw in Chart 3 above.

In the figures 5 and 6 we turn to the importance of employment in the secondary sector for each of Russia's regions in 1897 and 1959.

Figure 5: Secondary sector employment by region – Russia, 1897 (share of total workforce accounted for by region weighed against population size)



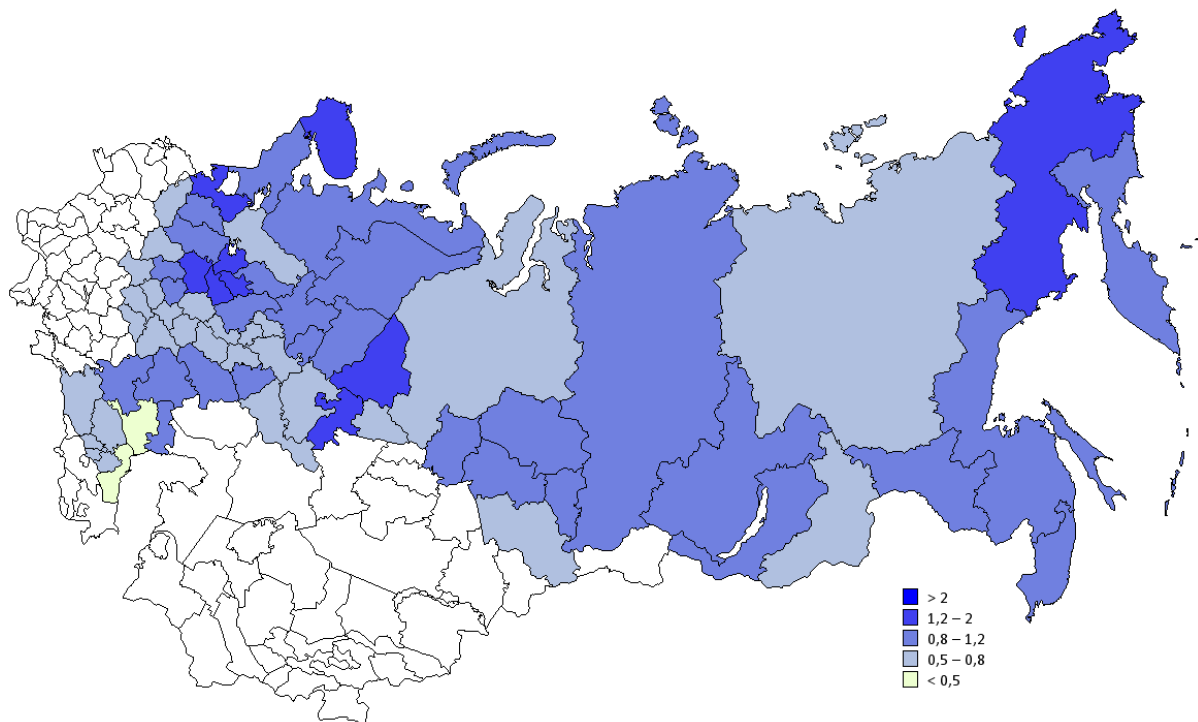
Source: Calculated by authors from G. Kessler & A. Markevich, *Electronic Repository for Russian Historical Statistics* (2014), <http://ristat.org/>; *Pervaia vseobschaia perepis' naseleniia Rossiiskoi imperii 28 ianvaria 1897 goda*, 86 vols. (St. Petersburg, 1905); *Obshchii svod po imperii rezul'tatov razrabotki dannykh pervoi vseobshchei perepisi naseleniia, proizvedennoi 28 ianvaria 1897 goda*, 2 vols. (St. Petersburg, 1905).

Clearly, secondary sector employment is distributed much more unequally across the country. The number of regions with a share of secondary sector employment proportional to their population is quite limited - most regions either show a certain degree of specialisation in manufacturing, or a very limited presence of secondary sector employment. Several key areas for manufacturing show up on the map – the Central Industrial Region around Moscow, the St. Petersburg region, the Russian Far East, and the Black Sea coastal province of the North Caucasus. This offers no surprises, considering what we know about industrial development in the late 19th century Russian Empire, except perhaps the focus on secondary sector employment in the Russian Far East and the Black Sea coastal province. In both regions secondary sector employment was probably related to the presence of large ports - Novorossiisk on the Black Sea, from which grain produced in the agricultural hinterland was shipped to international markets, and Vladivostok and Nikolaevsk on the Amur in the Far East. It needs to be said, though, that in both regions population densities were very low and this might have affected the outcome of calculations.

Finally, what is surprising in Figure 5 is that the Urals region, the second most important centre of iron and metalworking industry in the Russian Empire (next to the Donbass-region in modern-day

Ukraine), exhibits a level of secondary sector employment in line with its population size. Apparently, therefore, regional specialisation need not always immediately translate itself into significant shifts in the structure of employment.

Figure 6: Secondary sector employment by region – Russia, 1959 (share of total workforce accounted for by region weighed against population size)



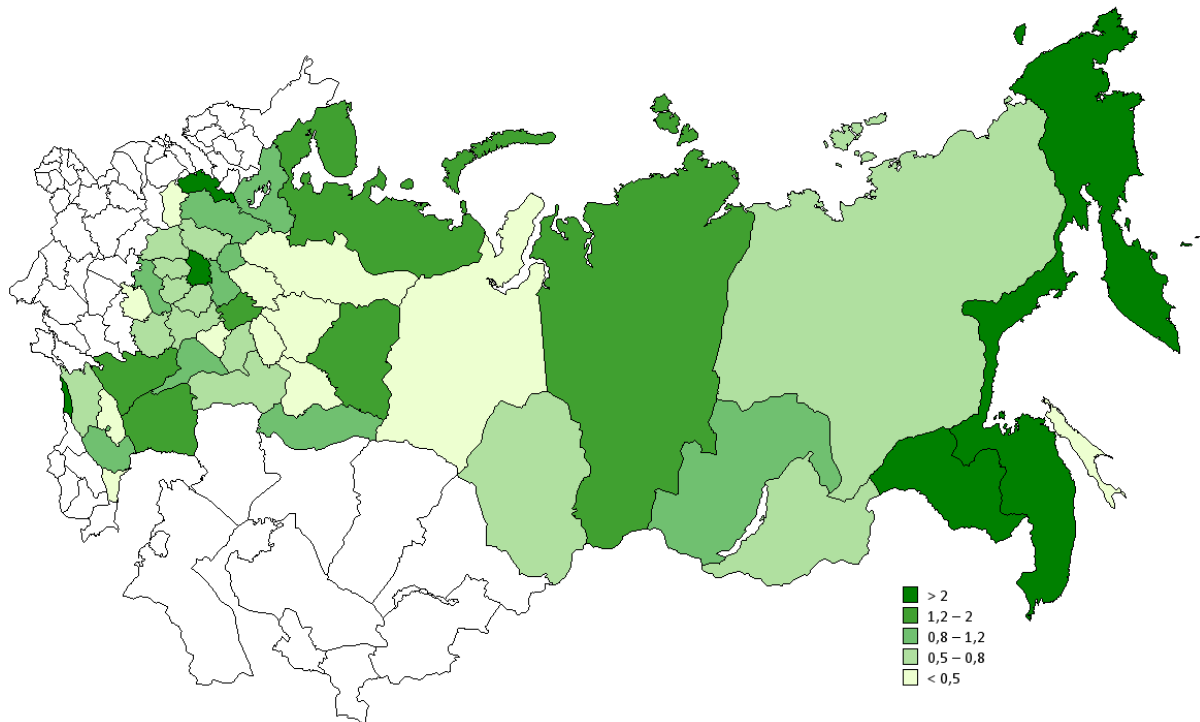
Source: Calculated by authors from G. Kessler & A. Markevich, Electronic Repository for Russian Historical Statistics (2014), <http://ristat.org/>

Figure 6 reads as the negative of figure 4 in many respects - areas with a low share of agricultural employment in 1959 have a large share of secondary sector employment, and vice versa. Compared to 1897 (figure 5), the main trend over time is the spread of employment in manufacturing from two industrial heartlands in European Russia, around Moscow and St. Petersburg to other areas of the country in the East and North, notably the Urals, the Murmansk region, parts of central and Eastern Siberia, as well as the Russian Far East. This finding conforms well with what we know about Stalinist industrialisation, which aimed for the exploitation of the mineral resources of the country's Northern Asian territories, building factories right along the main extraction sites. What should be noted is that industrial development in these regions had been contingent upon the widespread use of convict labour from the vast network of labour camps which had been set up from the 1930s on.¹⁵

The figures 7 and 8, finally, show the geographical distribution of employment in transport and communication.

15. Khlevniuk, Oleg V., "Prinuditel'nyi trud v ekonomike SSSR, 1929-1941 gody", *Svobodnaia Mysl'*, 3 (1992), pp. 73-84.

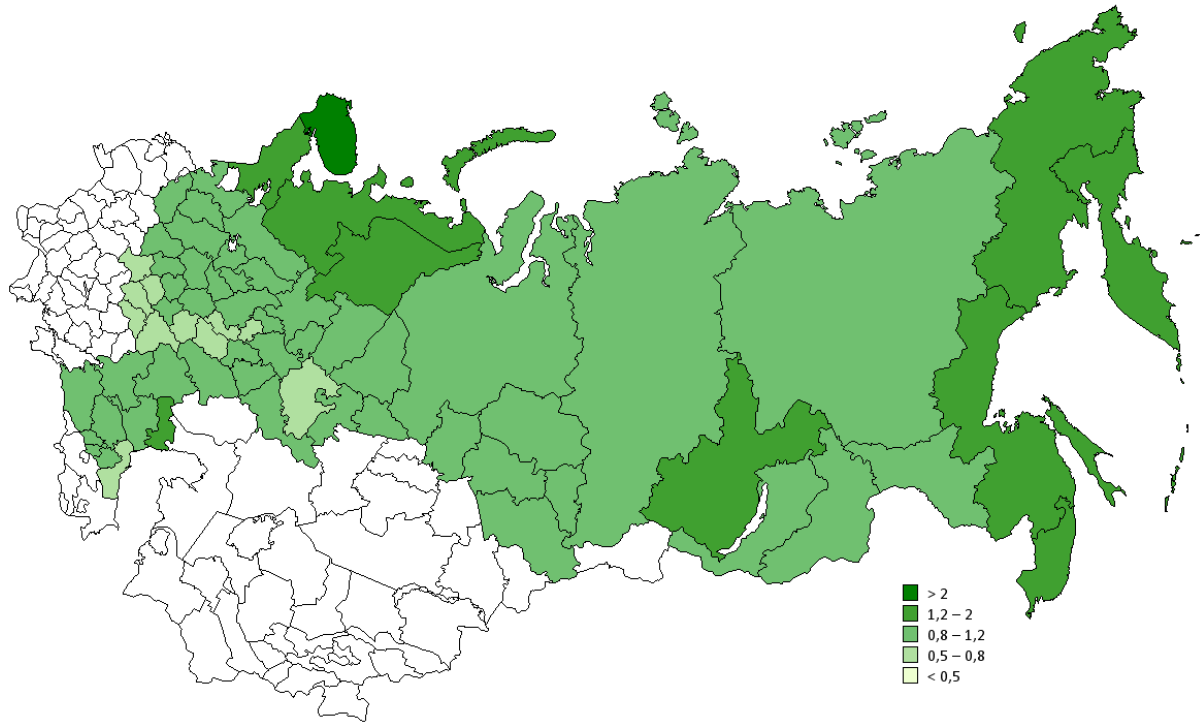
Figure 7: Employment in transport & communication by region – Russia, 1897 (share of total workforce accounted for by region weighed against population size)



Source: Calculated by authors from G. Kessler & A. Markevich, *Electronic Repository for Russian Historical Statistics* (2014), <http://ristat.org/>; *Pervaia vseobschaia perepis' naseleniia Rossiiskoi imperii 28 ianvaria 1897 goda*, 86 vols. (St. Petersburg, 1905); *Obshchii svod po imperii rezul'tatov razrabotki dannykh pervoi vseobshchei perepisi naseleniia, proizvedennoi 28 ianvaria 1897 goda*, 2 vols. (St. Petersburg, 1905).

Figure 7 clearly shows how employment in transport and communication were an important factor in two sets of regions. In the first place these were regions, where ports, navigable rivers and/or railway hubs were located, such as the Russian Far East, the European Far North, the Lower Volga, the Black Sea coast, and certain parts of Siberia. In the second place these were regions with a substantial degree of industrial development, like Moscow, St. Petersburg and the Urals, to which employment in transport and communication apparently were a corollary.

Figure 8: Employment in transport & communication by region – Russia, 1959 (share of total workforce accounted for by region weighed against population size)



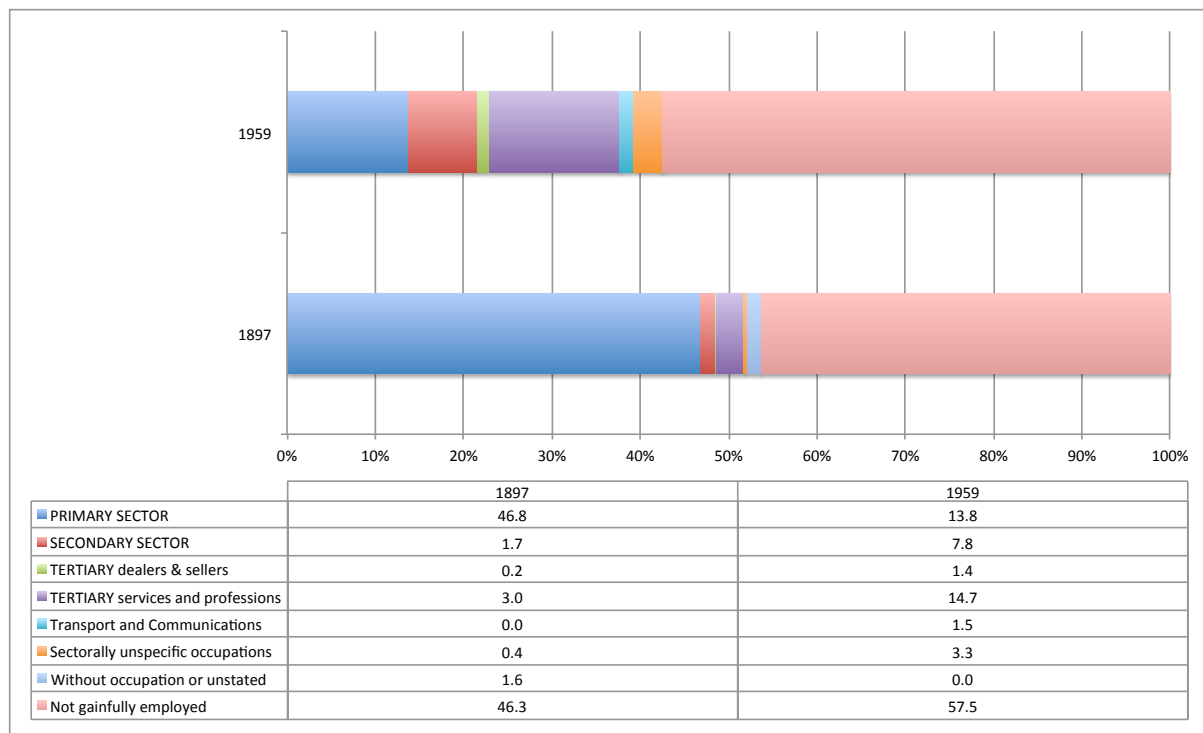
Source: Calculated by authors from G. Kessler & A. Markevich, Electronic Repository for Russian Historical Statistics (2014), <http://ristat.org/>

By 1959, however, a completely different picture has emerged - employment in transport and communication has become much more uniformly distributed across the country, with most regions showing a level of employment in this sector consistent with their population size. Apparently, these sectors have lost much of their pioneering role by 1959 and are simply part and parcel of the infrastructural fabric of regions regardless of their economic make-up.

Gender Perspective, 1897–1959

Previously, in chart 3, we discussed shifts in the sectoral structure of the workforce between 1897 and 1959. In this section of the paper we take a gendered approach to the issue. The data are presented in Charts 4 and 5, set-up in the same way as Chart 3.

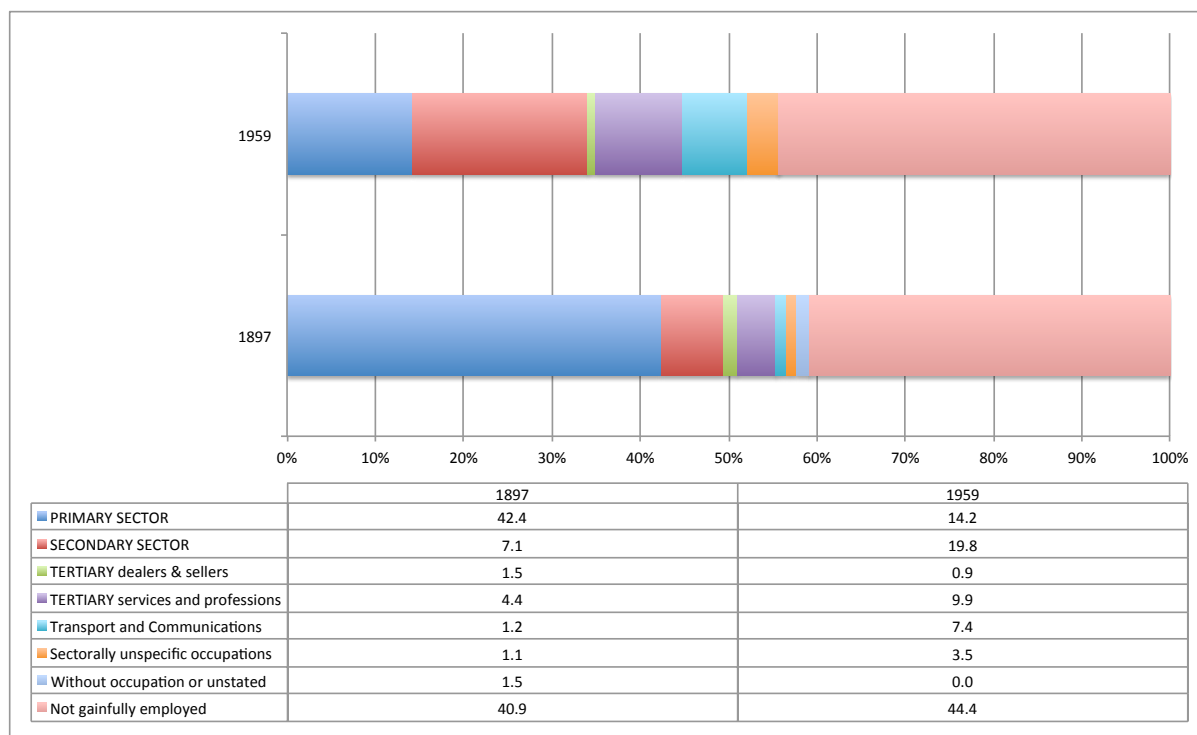
Chart 4: Female workforce by sector, Russia 1897–1959 (% of total female population)



Source: Calculated by authors from G. Kessler & A. Markevich, Electronic Repository for Russian Historical Statistics (2014), <http://ristat.org/>; *Pervaia vseobschaia perepis' naseleniia Rossiiskoi imperii 28 ianvaria 1897 goda*, 86 vols. (St. Petersburg, 1905); *Obshchii svod po imperii rezul'tatov razrabotki dannykh pervoi vseobshchei perepisi naseleniia, proizvedennoi 28 ianvaria 1897 goda*, 2 vols. (St. Petersburg, 1905).

A first observation concerning Chart 4 is that in 1959 a much larger share of the female population than in 1897 was not gainfully employed – 57.5 and 46.3% respectively. If we allow, however, for the fact that in 1897 female gainful employment consisted primarily of work on the family farm, the 1959 labour participation rates among women do however emerge as impressive, particularly because about two-thirds of it was employment in the secondary and tertiary sectors. Of these two, meanwhile, the tertiary sector clearly leads among female employment in 1959. For women, the move out of agriculture would appear to have involved above all a move into tertiary sector employment. Clearly, women specialised in service sector professions, most likely in education, health care and office jobs.

Chart 5: Male workforce by sector, Russia 1897–1959 (% of total male population)



Source: Calculated by authors from G. Kessler & A. Markevich, Electronic Repository for Russian Historical Statistics (2014), <http://ristat.org/>; *Pervaia vseobschaia perepis' naseleniia Rossiiskoi imperii 28 ianvaria 1897 goda*, 86 vols. (St. Petersburg, 1905); *Obshchii svod po imperii rezul'tatov razrabotki dannykh pervoi vseobshchei perepisi naseleniia, proizvedennoi 28 ianvaria 1897 goda*, 2 vols. (St. Petersburg, 1905).

If we look at the male population (Chart 5), we can observe a similar decline in the importance of primary sector employment, but whereas for women this meant a move into the tertiary sector, men appeared to have focused on secondary sector employment, the share of which increased almost threefold from 7.1% in 1897 to 19.8% in 1959. Work in transport and communication as well was above all a male affair. Labour participation rates for men, meanwhile, at just under 60% of the population, are consistent with full employment of the population of working-age.

Conclusions

Let us briefly summarise some of our findings. In terms of shifts in the balance between sectors our findings roughly conform to expectations, given existing knowledge on the social and economic history of Russia and the Soviet Union in the twentieth century; a move out of agriculture into industry and services, an emphasis on heavy industry over consumer goods industry and an

underdeveloped trading profession.

Having said this, what comes perhaps as somewhat of a surprise is that agriculture did not see its share of the workforce reduced even more, considering that we are dealing with a complete transformation from a smallholder peasant agriculture to a system of mechanised agriculture on extremely large landholdings. If anything, this testifies to the very low labour productivity in Soviet agriculture, considering that in 1897 Russia had been a net exporter in grain, whereas by 1963 the Soviet Union would start to import grain. Indeed, Soviet agriculture of the late 1950s was unable to adequately feed the population, considering that most food consumed was not even produced on formal agricultural holdings, but on the small subsidiary garden plots of the population instead.

The geographical distribution of employment in the various sectors shows the emergence of a process of regional specialisation in agriculture by 1959, even if there still were a lot of regions where agriculture appears to be default behaviour, even if these regions were not particularly well-suited for the purpose. As far as the secondary sector is concerned the 1959 geographical distribution closely follows patterns of investment over the preceding decades, directed towards the East and North of the country, where new industrial centres appeared in addition to Moscow and St. Petersburg. The distribution of employment in transport reveals how this sector fulfilled a pioneering role during industrial take-off of the late 19th century in certain parts of the country, but had essentially become a derivative of population size by 1959.

In terms of gendered patterns of sectoral employment the paper demonstrates a move out of agriculture into industry and services, but with a clear preference of women in the 1959 Soviet Union for services and professions, rather than work in manufacturing.

Ultimately, however, the main finding of the paper relates to what it does not directly show. The essential insight derived from the application of the PST coding scheme to the data on England has centred on the fact that the share of secondary sector employment turned out to have increased much less significantly during the industrial revolution than had been hitherto assumed. This finding underlines secondary sector labour productivity growth during the crucial Industrial Revolution period. For Russia and the Soviet Union we definitely deal with a different situation. Here, industrialisation was accompanied by a significant increase in labour inputs in manufacturing. Soviet industrialisation is notorious for having essentially been extensive for a long period, relying primarily on extra factor inputs to achieve a larger output, and labour inputs have been argued to have played a crucial role in this respect.¹⁶ The findings of our paper confirm this, and in a wider comparative context this spurs a renewed interest in the debate on capital vs. labour intensive industrialisation paths in global history.¹⁷

16. Allen, Robert C., *Farm to Factory. A reinterpretation of the Soviet Industrial Revolution*. (Princeton and Oxford, 2003)

17. Austin, Gareth and Kaoru Sugihara (eds), *Labour-Intensive Industrialization in Global History*, Routledge Explorations in Economic History (2010)