

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

Gijs Kessler (International Institute of Social History) - *gke@iisg.nl*
Timur Valetov (Moscow State University) - *tim@hist.msu.ru*

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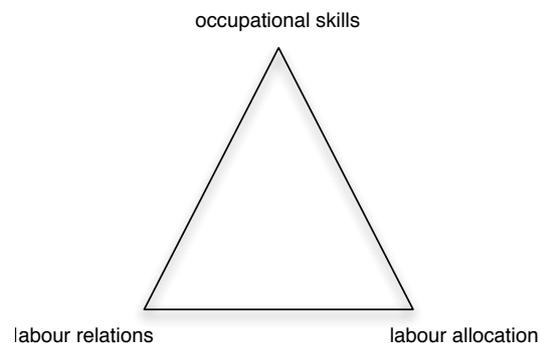
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Introduction

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.

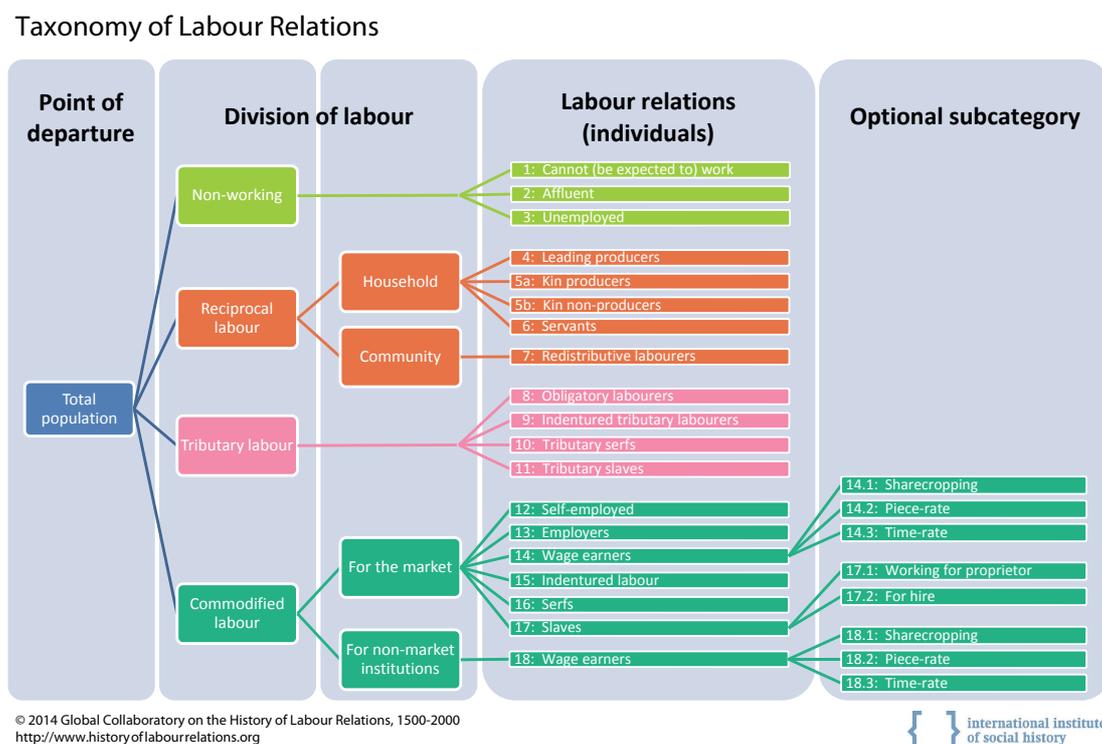
Ultimately, therefore, the three fields of investigation outlined above correspond to different perspectives on the process of occupational change, each with its own measurement techniques and data requirements. Foremost among these measuring techniques in all three fields is the reliance on a unified 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

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>

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).

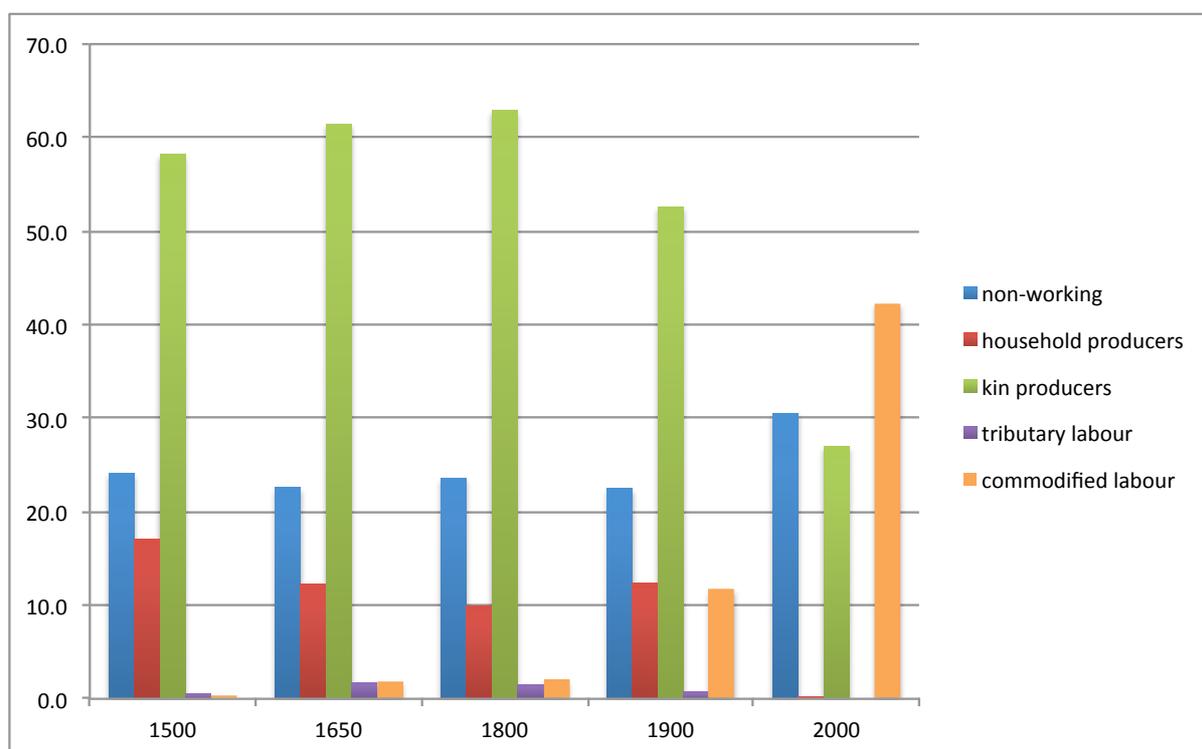
Figure 2: Taxonomy Global Labour Relations



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 the 1959 data 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

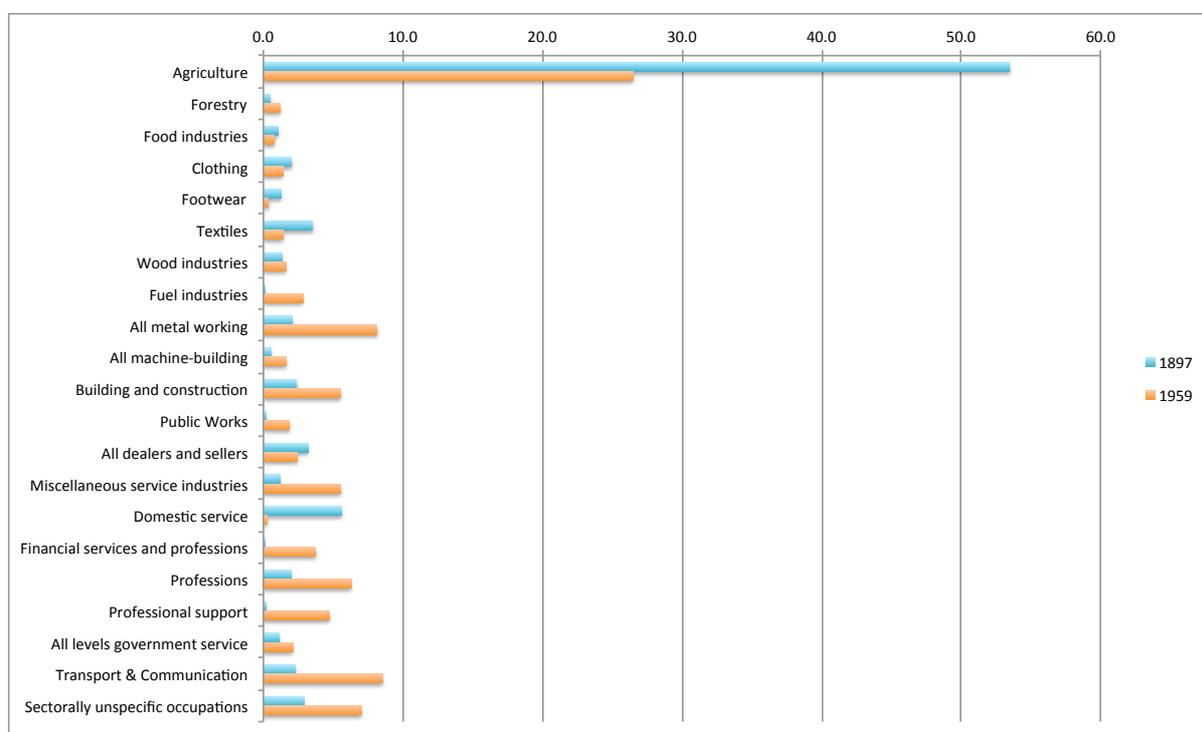
The appendix to this paper contains the full range of data for the two benchmark-years, coded in PST for the first two digits, reflecting 'sector' and 'group'. In the paragraphs below we have highlighted some of the most significant changes which can be observed over time. First, we look into sectoral change, both for the country as a whole and in terms of regional differentiation for 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 their choice 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' (cf. appendix 1). 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. As a quick glance at appendix 1 reveals, 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%)



Source: Calculated by authors from G. Kessler & A. Markevich, Electronic Repository for Russian Historical Statistics (2014)

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 in half over the sixty-year period under study, from 53.5% to 26.5%. This move out of agriculture fuelled the rise of other groups, none of which, however, 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.

If we consider in some more detail the rise of the other sectors, the main trends are (1) the rise of heavy industry, in particular metal-working and 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 2.3% 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 on. 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.⁷ Although not strictly forbidden, the hiring of domestic workers in the 1959 Soviet 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.

This brings us to the second set of shifts which can be traced in Chart 2 – the demise of several groups which were important in 1897, but no longer so in 1959. Apart from domestic service, these are, significantly, (1) light industry and (2) trade.

For all branches of light industry which made it into Chart 2 (food industries, clothing, textile and footwear), the share of gainful employment declined. 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, with the exception of clothes, which were largely home-produced until the 1970s-80s.⁸ If we would add the people engaged in the home-production of consumer goods to the 1897 data the decline of the share of the workforce by 1959 would look even more dramatic. 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

7. Cf. Engel, Barbara Alpern, *Between the fields and the city: women, work and family in Russia 1861-1914* (Cambridge and New York, 1994)

8. Tyazhelnikova, Victoria, "The value of domestic labour in Russia, 1965-186", *Continuity and Change*, 21(1) (2006), pp. 159-193.

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 workforce engaged in the production of consumer goods could also just have declined due to mechanisation and other increases in labour productivity.

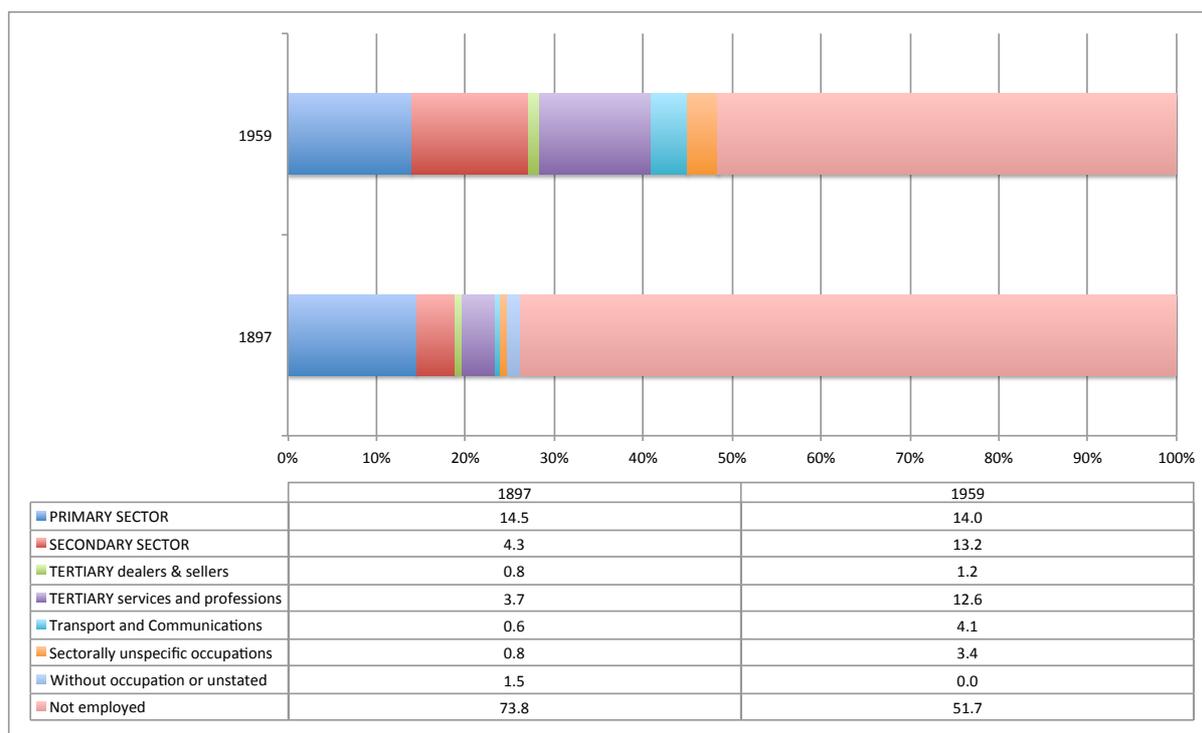
The reduction of the share of trade in the total workforce, meanwhile, is perhaps the most vivid illustration of the non-capitalist nature of the Soviet economic model, in which wholesale trade had been replaced by administrative allocation of resources, and retail trade underdeveloped in sync with the suppression 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.⁹ It is for this purpose that in its first digit PST distinguishes six 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 for this choice is that allows one to take into account two things: (1) shifts in the ratio between gainfully employed and non-working (cf. the section on labour relations above) and (2) the possible omission of not formally employed kin-producers in peasant households, in particular women, in the 1897 data. Unfortunately, we do not know for sure exactly how the 1897 census-takers counted those employed in agriculture, but given the strong culture of patriarchy in the Russian countryside, it seems plausible that a large part of rural women would be counted as non-gainfully employed, their crucial role in the peasant household economy notwithstanding.

9. E.A. Wrigley, "The PST system of classifying occupations" [<http://www.geog.cam.ac.uk/research/projects/occupations/britain19c/papers/paper1.pdf>], as retrieved on 15 April 2014

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)

Chart 3 presents a somewhat different picture than chart 2. To start with, when set off against the population in its entirety the demise of the primary sector is much less pronounced than the data on agriculture from chart 2 suggest. In 1897 it employed 14.5% of the population, against 13.97% in 1959. As we will see below, the explanation for this puzzling finding is indeed what we suggested: a sizeable part of the female population engaged in agriculture must have been registered as not-employed in the 1897 census.

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. Last, but not least, chart 3 shows an impressive overall labour participation rate in 1959 Soviet society at 48.3% of the total population aged 0 to >99.

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 3-6 the geographical distribution of sectoral employment is presented for two of the first-digit sectors of PST – the secondary sector and transport & communication. Of the eight sectors of PST we have chosen these two because their regional distribution is expected to be least dependent on factors of geography itself, unlike the primary sector, and therefore their distribution reflects in first instance the outcomes of economic decision-making processes and deliberate development efforts.

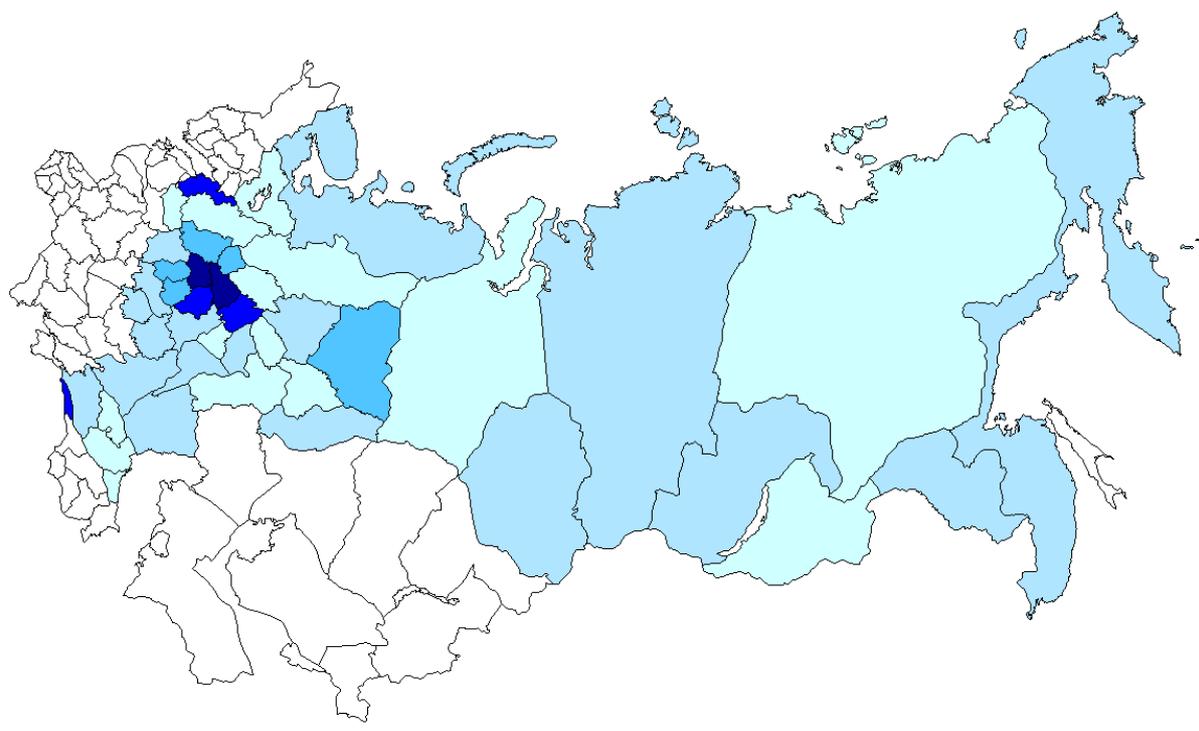
Figures 3 and 4 show the importance of employment in the secondary sector for each of Russia's

regions in 1897 and 1959. 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.¹⁰

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. This conforms well with what we know about Stalinist industrialisation, which aimed for the exploitation of the mineral resources of the country's Asian territories, building factories right along the main extraction sites.

At the same time, figure 4 also testifies to the increasing homogeneity of employment patterns across the country by 1959, with the majority of regions in both West and East of the country having between 20 and 30% of their workforce employed in manufacturing.

Figure 3: Secondary sector employment by region – Russia, 1897 (share of total workforce per region)



Source: Calculated by authors from G. Kessler & A. Markevich, Electronic Repository for Russian Historical Statistics (2014)

Legend (from dark to light):

≥30% of all gainfully employed

10. 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.

20-30% of all gainfully employed
 15-20% of all gainfully employed
 10-15% of all gainfully employed
 <10% of all gainfully employed

Figure 4: Secondary sector employment by region – Russia, 1959 (share of total workforce per region)



Source: Calculated by authors from G. Kessler & A. Markevich, Electronic Repository for Russian Historical Statistics (2014)

Legend (from dark to light):
 ≥30% of all gainfully employed
 20-30% of all gainfully employed
 15-20% of all gainfully employed
 10-15% of all gainfully employed
 <10% of all gainfully employed

Figures 5 and 6 show the geographical distribution of employment in transport and communication. In 1897 employment in transport appears to have been spread rather evenly across the country, with the only outliers being the Far Eastern coastal province with 5-7% of the workforce, probably almost entirely attributable to the Vladivostok port, and the coastal province of the North Caucasus (7-10%), where some of the ports were located through which grain produced on the steppe hinterland of the Black Sea was exported to the world market. Internal river and rail transport

does not appear to have been accompanied by any regional or local concentrations of employment in this sector.

By 1959, however, a completely different picture has emerged - the Eastern and Northern territories of the country consistently show the highest percentages of the workforce employed in transport and communication, which is a vivid illustration of the deliberate infrastructural development effort in these remote and relatively thinly populated regions.

Figure 5: Employment in transport & communication by region – Russia, 1897 (share of total workforce per region)



Source: Calculated by authors from G. Kessler & A. Markevich, Electronic Repository for Russian Historical Statistics (2014)

Legend (from dark to light):

≥10% of all gainfully employed

7-10% of all gainfully employed

5-7% of all gainfully employed

2-5% of all gainfully employed

1-2% of all gainfully employed

<1% of all gainfully employed

Figure 6: Employment in transport & communication by region – Russia, 1959 (share of total workforce per region)



Source: Calculated by authors from G. Kessler & A. Markevich, Electronic Repository for Russian Historical Statistics (2014)

Legend (from dark to light):

≥10% of all gainfully employed

7-10% of all gainfully employed

5-7% of all gainfully employed

2-5% of all gainfully employed

1-2% of all gainfully employed

<1% of all gainfully employed

Gender Perspective, 1897–1959

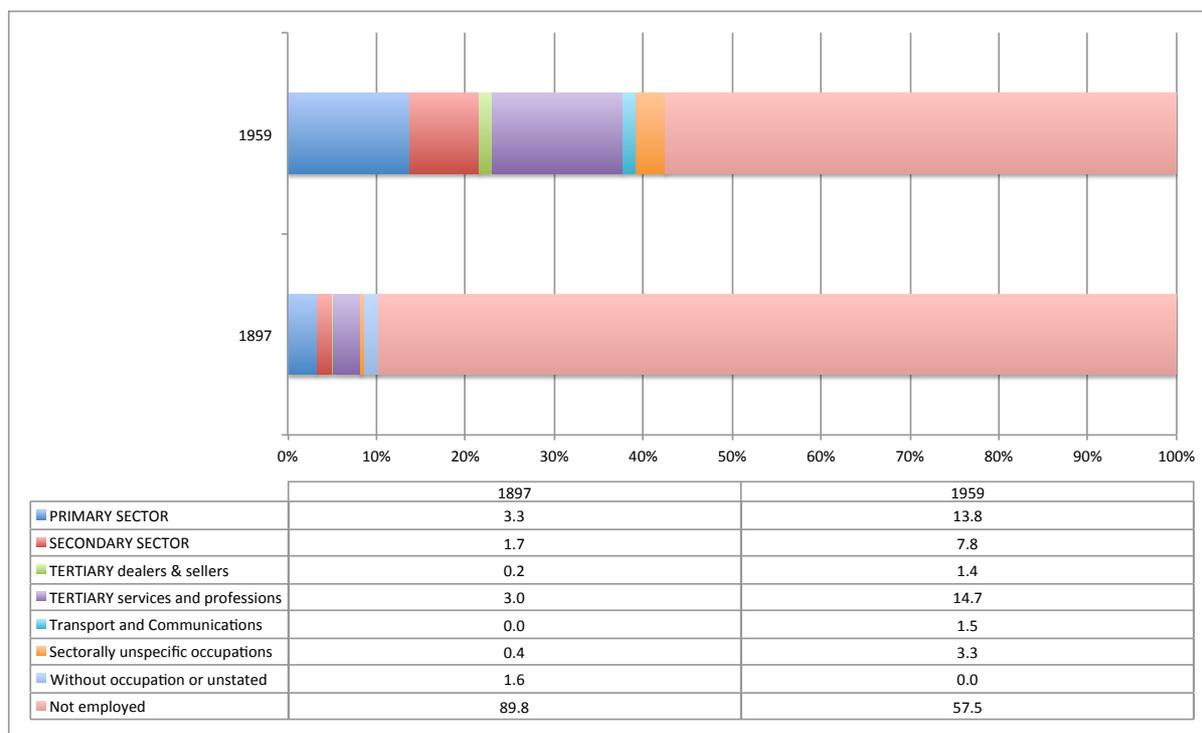
When discussing shifts in the sectoral structure of the workforce between 1897 and 1959 as shown in Chart 3 we briefly dwelt on the issue of gender differences, primarily in relation to under-registration of employment in agriculture in 1897. In this section of the paper we focus on gender differences in somewhat more detail. The data are presented in Charts 4 and 5, set-up in the same way as Chart 3. The above-mentioned under-registration of peasant women working in agriculture is eloquently borne out by chart 4, which shows an improbable formidable increase in the importance of employment in agriculture for women between 1897 and 1959. It clearly follows from this, that

part of the women registered in 1897 as not-employed ought to be reclassified as working agriculture, but until a sound way of estimating the size of this contingent has been developed, we ought to leave the graph as is.

Let us focus instead on the sectors where no such registration deficiencies occur - manufacturing and the service sector. Both sectors increase in importance among the female workforce, but the increase of the importance of services is most impressive. Accounting for only 3.01% of the female population in 1897, this increases almost fivefold to 14.72% in 1959, as compared to only 9.86% for men in the latter year. Clearly, women specialised in service sector professions, most likely in education, health care and office jobs.

Leaving aside 1897, because of registration issues, the 1959 data also show a significant overall female labour participation rate of 42.5%, which is lower than the equivalent male rate of 55.6%, but not of a fundamentally different order of magnitude, testifying to the effect of more than thirty years' equal opportunities and encouragement of female employment outside the house.

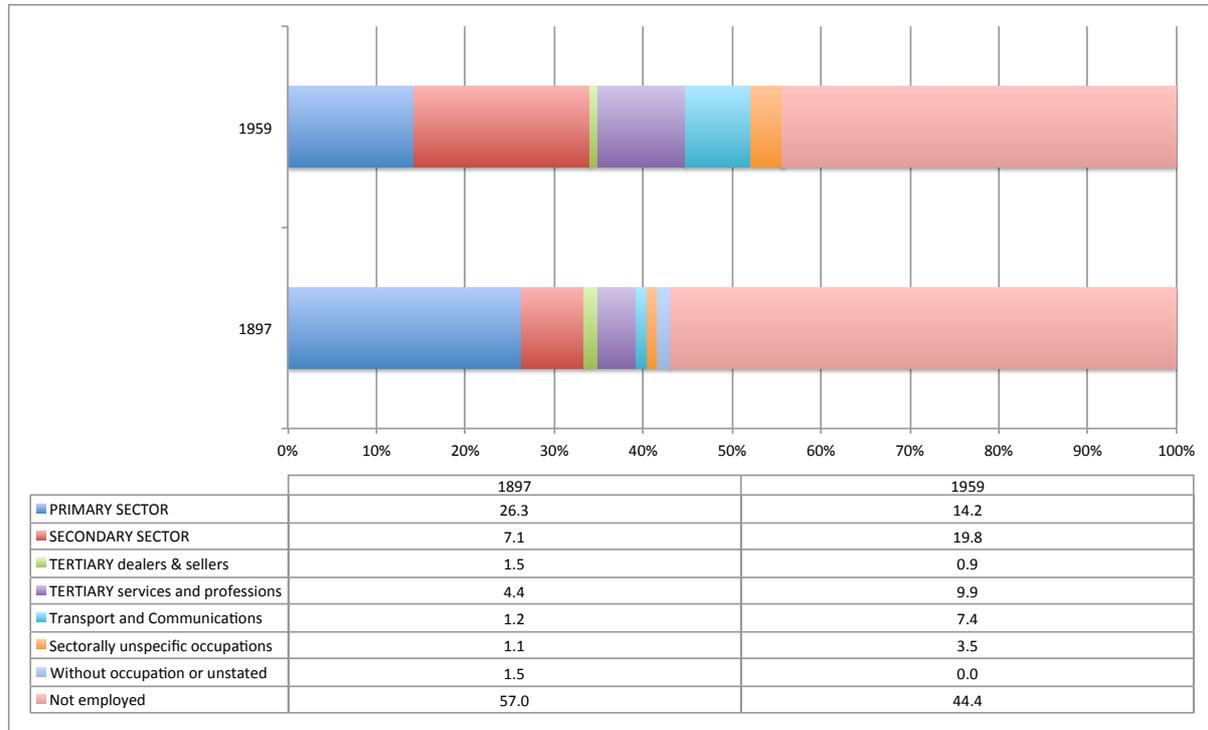
Chart 4: Female workforce by sector, Russia 1897–1959 (% of total female population)



Source: Calculated by authors from G. Kessler & A. Markevich, Electronic Repository for Russian Historical Statistics (2014)

If we look at the male population (Chart 5), we can observe the real decline in importance of agriculture from 26.3% of the population in 1897 to 14.2% in 1959, and increases in the importance of manufacturing, services and transport, all in line with the general pattern. Compared to chart 4, however, we can conclude that work in transport and communication was above all a male affair.

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)

Conclusions

By way of concluding remarks, let us briefly summarise some of our findings from this first comparative exercise. 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. 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, if we consider that in 1897 Russia had been a net exporter in grain, whereas by 1963 the Soviet Union would start to import grain.

Some of the changes found over time are entirely consistent with the transition from a capitalist to a socialist economy, in particular the decrease of trade in sectoral employment. Within manufacturing we observe a manifest shift in labour allocation from light to heavy industry, indicative of Soviet investment priorities and forcibly reduced consumption in the USSR.

The geographical distribution of employment shows disappointingly little surprises and closely follows patterns of investment, directed towards the East and North of the country. Behind this,

however, is a story of migration, considering that these were scarcely inhabited parts of the country and most of the industrial workforce would have come from the European parts of the country.

In terms of gender, finally, results are somewhat inconclusive, because of underregistration of rural women in the peasant economy in 1897, but apart from an increase in female labour participation rates it is also clear that women in the 1959 Soviet Union specialised in services and professions.