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Abstract

The communist states promoted women's participation in the labour market and encouraged women to enter male-dominated occupations, which should have resulted in relatively low levels of occupational segregation by gender. I show, however, that after the transition to the market economy, the level of occupational segregation by gender in Poland did not increase, but remained rather stable. I exploit the cohort and regional variation in exposure to communist propaganda to analyse the role of social norms in shaping occupational segregation by gender. The results suggest that the fostering of women's empowerment by communist authorities may have been limited to the early phase of the communist era.

Keywords: Occupational segregation, Gender, Economic transition, Communism, Culture

JEL Classification: J16, J24, P26

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Introduction

Occupational segregation by gender remains one of the most important sources of the gender pay gap because male-dominated occupations tend to have higher wages than female-dominated occupations. Several recent studies have analysed trends in occupational segregation by gender, and found large differences in these trends between countries. Blau, Brummund, and Yung-Hsu Liu, (2013) found that in the US, occupational segregation decreased substantially in the 1970s and the 1980s, declined moderately in the 1990s, and remained stable in the 2000s. A similar pattern was found for Brazil (Salardi, 2016). Levels of gender segregation have decreased in Northern Europe, but have increased in Southern Europe (Dueñas Fernández, Iglesias Fernández, and Llorente Heras, 2014). Research for Trinidad and Tobago indicated that occupational segregation by gender remained stable over the 1990s and the 2000s (Sookram and Strobl, 2009).

It has been demonstrated that a large share of the recent changes in occupational segregation by gender were driven by changes in skills demand and skills supply (G. M. Cortes, Jaimovich, and Siu, 2018). This process may be related to technological changes - as automation leads to lower demand for motor skills and higher demand for cognitive and social skills, women have been increasingly entering male-dominated occupations (Black and Spitz-Oener, 2010; Deming, 2017; Weinberg, 2000). Baker and Cornelson, (2018) showed, however, that a large part of the variation remains unexplained. There is evidence of large differences in levels of occupational segregation by gender across ethnicities and between the formal and the informal sector (Alonso-Villar, del Rio, and Gradin, 2012; del Rio and Alonso-Villar, 2015; Salardi, 2016). Thus, a number of scholars have raised the question of how social norms and institutions have been shaping occupational segregation by gender (Antecol and Cobb-Clark, 2013; Bailey, Hershbein, and Miller, 2012; P. Cortes and Pan, 2018; Levanon and Grusky, 2016).

I analyse trends in occupational segregation by gender in Poland, a post-communist country that experienced the transition to a market economy in 1989. The communist authorities in Eastern Europe promoted the principle of women's emancipation (Gal and Kligman, 2012). For example, the communist-era Polish constitution included a number of provisions ensuring gender equality in the economic, social, and cultural spheres (Adamchik and Bedi, 2003). The goal of increasing the number of women working in traditionally male-dominated occupations was a core element of the communist ideology at least during the early phase of the communist era in Poland. This should have resulted in lower levels of occupational segregation before the transition to a market economy. How these occupational segregation levels should have changed after the transition is less clear.

While many studies have analysed the changes in the gender pay gap after the transition to a market economy in Eastern Europe (Adamchik and Bedi, 2003; Grajek, 2003; Newell and Reilly, 2001), there is little research on the evolution of occupational segregation by gender in transition countries. I attempt to fill this gap by analysing long-run trends in occupational segregation more than two decades after the transition to a market economy. Additionally, I exploit the variation in exposure to socialist propaganda and the influence of the Catholic Church to examine how social norms have shaped the occupational segregation. I argue that the degree to which the promotion of egalitarian gender roles affected a given individual was largely driven by two factors: the person's year and place of birth. Fidelis, (2010) showed that in Poland, egalitarian social norms were heavily promoted in the early phase of the communist era (1945-1956). During this period the country rapidly industrialised, and the number of women working in traditionally male-dominated occupations increased. School textbooks were filled with images of women working in heavy industry and agriculture. The situation of women changed after the Stalinist period ended in 1956. Programs that promoted women's empowerment were denounced as reflecting the ideology of the oppressive Stalinist regime, and women were even banned from working in several occupations. At that time, the official propaganda encouraged women to take in traditional family roles. I exploit the differences in the content of the official propaganda in different periods by analysing the occupational segregation trends for different birth cohorts. The oldest cohorts (born between 1940 and 1949) were more exposed to the communist propaganda that promoted egalitarian gender norms. The subsequent cohorts (born between 1950 and 1969) were not only exposed to less progressive propaganda than the oldest cohort, they also witnessed mass protests against the communist system. I find that the occupational segregation levels among workers from the oldest birth cohorts were much higher than the levels among workers from the subsequent cohorts.

Second, I exploit the changes in Poland's borders after World War II to analyse the variation in occupational segregation depending on the region's susceptibility to communist propaganda. In the aftermath of World War II, Poland lost 46% of its prewar eastern territory to the Soviet Union, but gained new territory from Germany - the so-called Western Territories. Historically, the Western Territories were controlled by Germany, and had very small Polish-speaking minorities. But after World War II, Germans were forced to leave the area, and the Western Territories were repopulated with Poles. A complete population transfer involving 13 million people (eight million expelled Germans and five million resettled Poles) created a unique setting for research (see for example recent studies by Charnysh, (2019) and Becker et al., (2018)). Although they were exclusively Polish, the people who moved to the Western Territories came from different areas, with some of these settlers coming from central Poland or the former eastern territories annexed by the Soviet Union, and others returning to Poland from southern and western Europe. Since housing was limited, it was impossible to resettle whole communities. Thus, the settlers had to build completely new institutions and

social networks. As a result of these specific conditions, communism was implemented differently in the Western Territories than in the territories of pre-war Poland. It may have been easier to fill the void in the Western Territories with new communist institutions than it was to replace the existing social structures and institutions in pre-war Poland. Strong institutions, such as the Catholic Church, and local traditions may have hampered the spread of the communist ideology in pre-war Poland. There is, for example, evidence that the collectivisation of agriculture was more advanced in the Western Territories than it was in pre-war Poland. This is the first study to analyse the differences in occupational segregation by gender in the Western Territories and the pre-war regions of Poland. As I find no significant differences in the levels of and trends in occupational segregation in the Western Territories and in pre-war Poland, the assumption that women's empowerment played an important role in the communist state's policies may be called into question.

I contribute to the existing literature in the following ways. First, this is the first study to analyse long-run trends in occupational segregation by gender in a post-communist country. Second, I exploit the variation in the exposure of cohorts to communist propaganda. Finally, I draw on the unique regional division of Poland to analyse differences in the levels of and the changes in occupational segregation by gender between regions with different degrees of susceptibility to communist propaganda. The remainder of this article is structured as follows. In the next section, I describe the changes in social norms after the transition to a market economy in Poland. In section 3, I describe the dataset and introduce the methods. Section 4 presents the results of the analysis of trends in occupational segregation by gender, and Section 5 concludes.

Social norms after transition

There are multiple studies presenting evidence of the persistence of the social norms promoted by socialist authorities. Alesina and Fuchs-Schündeln, (2007) showed that a decade after the reunification of Germany, preferences for state intervention and income redistribution were still much stronger in East Germany than in West Germany. Cooke, (2007) found that men were contributing more to household tasks in East Germany than in West Germany. Bauernschuster and Rainer, (2012) also exploited the unique situation of Germany to show that 15 years after the fall of the Berlin Wall, East Germans still held more progressive beliefs concerning gender roles than West Germans. Moreover, the authors saw no patterns of convergence in social norms between East and West Germany. Lippmann and Senik, (2012) compared the math skills of girls in West and East Germany, and found that the gender gap in math skills was significantly smaller in East than in West Germany. They argued that this finding can be attributed to East German policies that fostered

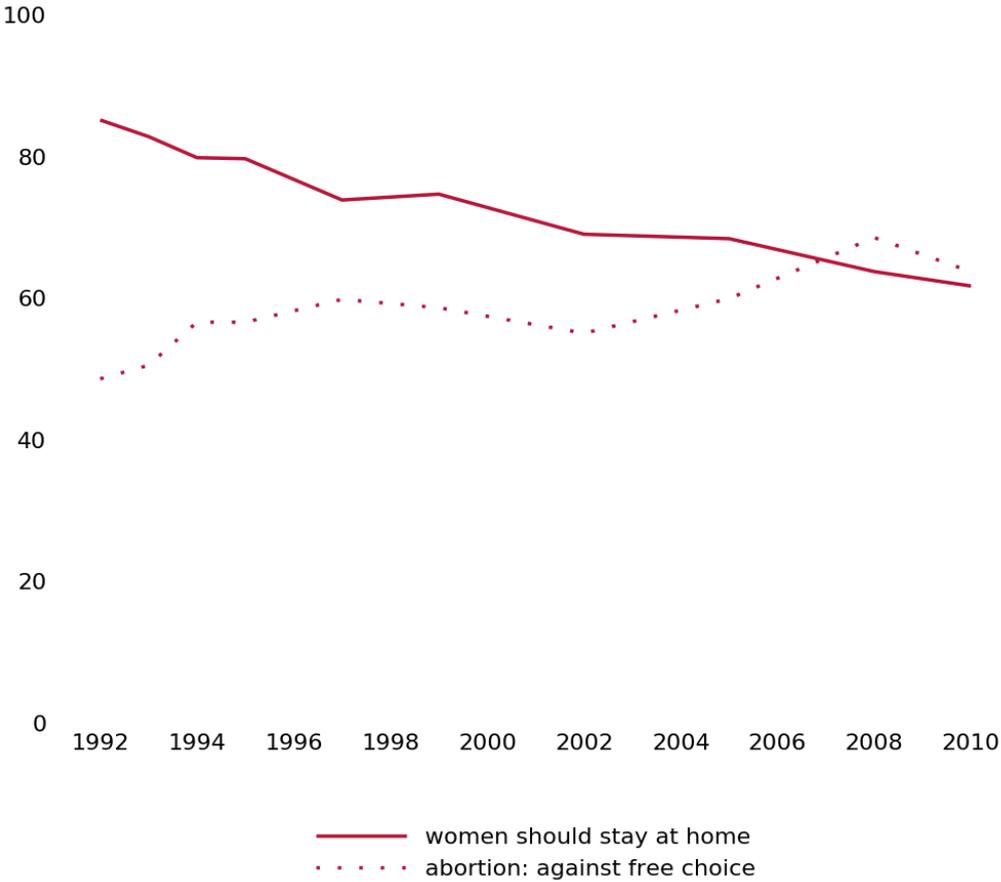
women's empowerment.

In some post-communist countries, however, social norms may have been changing rapidly because the collapse of communism was followed by a conservative backlash. Poland represents an interesting case for studying this issue. First, the rejection of communism was nowhere as strong as in Poland, and the democratic transition in Poland was followed by a conservative backlash in which the Catholic Church played a large role (Eberts, 1998; Heinen and Portet, 2010; Heinen and Wator, 2006; Hockenos, 2013). The considerable influence of the Catholic Church in Polish society after 1989 has been attributed to the historical position of the church, its strong association with the anti-communist movement, and widespread admiration of Pope John Paul II (Borowik, 2002; Kulczycki, 1995; Mishtal, 2009). It appears, for example, that the Catholic Church was one of the leading drivers of the tightening of abortion regulations in Poland (Eberts, 1998; Gal and Kligman, 2000; Jankowska, 1991). The second reason for focusing on Poland is the unique historical setting created by changes in the country's borders. After World War II, large parts of the country underwent almost complete population transfers (the so-called Western Territories). Thus, the dissemination of socialist propaganda was not hampered by existing institutions and social structures in this region. In addition, a lack of existing structures reduced the influence of the Catholic Church in the Western Territories.

The analysis of Polish General Social Survey (PGSS) offers interesting insights into the evolution of social norms after the fall of communism in Poland. PGSS is a survey that studied individual attitudes, values, and social behaviour during the post-transition period (1992-2010). The conservative backlash after 1989 can be clearly seen in statistics on support for the abortion ban. In 1992, less than 50% of Poles were against free choice in abortion, but by 2008 the share of Poles opposing free choice had reached nearly 70% (Figure 1). Although the trends were similar in both regions, the level of support for the abortion ban was around 10 pp. lower in the Western Territories than in pre-war Poland (regional differences in the evolution of social norms after the transition are discussed in detail in Appendix B). These findings are in line with the hypotheses regarding the conservative backlash and the differences in susceptibility to socialist propaganda in the Western Territories and pre-war Poland.

However, Figure 1 also shows that the evolution of attitudes toward women's work and family roles in post-transition Poland followed a very different path. The share of Poles who supported the view that it is better when the man works and the woman takes care of the home and family decreased substantially. The extremely conservative attitudes towards women's work and family roles observed at the beginning of the

Figure 1. Poland: social attitudes towards abortion and women at work



Note. The solid line shows % share of respondents, who agree with the statement: "it is much better for everyone involved if the man is the achiever outside the home and the woman takes care of the home and family". The dotted line shows % share of respondents, who responded "no" to the following question: "should it be possible for a pregnant woman to obtain a legal abortion if the woman wants it for any reason?".
 Data: Polish General Social Survey

transition suggest that the socialist state in Poland did not effectively promote egalitarian social norms regarding gender roles. Moreover, I find no significant differences in attitudes towards women in the workplace in the Western Territories and in pre-war Poland. Thus, the resistance of the existing social structures to communist propaganda cannot explain the persistence of traditionalist social norms during the communist era in Poland. These results may instead suggest that the communist authorities in Poland were not primarily interested in promoting egalitarian social norms.

Data and methods

I use data from the Polish Labour Force Survey to analyse trends in occupational segregation by gender. Polish LFS provides detailed information about the labour market situations of individuals, including information on their occupations. I analyse data from the 1995-2017 period, because 1995 is the first year for

which information on occupations is included. I use the Polish occupation classification, which is similar to ISCO at the three-digit level¹. I exclude the agricultural sector from the analysis for two reasons. First, levels of occupational segregation by gender are much lower in the agricultural sector than in the remaining sectors. Second, the decrease in employment in agriculture was among the key structural changes that occurred in Poland after the transition. Hence, any changes in overall occupational segregation by gender would have been largely driven by declining employment in agriculture. Thus, by excluding agriculture, I limit the extent to which the results of analysis are driven by structural changes. While structural changes may have still affected the changes in occupational segregation by gender outside of agriculture, I argue that such changes do not affect the conclusions of the study (see Appendix A for a detailed explanation).

I use the segregation index developed by O. D. Duncan and B. Duncan, (1955) to measure the extent of occupational segregation by gender. The segregation index S_t is given by

$$S_t = 100 * \left(\frac{\sum_i | \frac{m_{it}}{M_t} - \frac{f_{it}}{F_t} |}{2} \right) \quad (1)$$

where m_{it} (f_{it}) is the number of males (females) who are employed in occupation i at time t , and M_t (F_t) is the total number of male (female) workers at time t . The values of the segregation index S_t range from zero to 100, where a value of zero indicates no segregation and a value of 100 indicates complete segregation. I calculate the segregation index for different birth cohorts, and separately for the Western Territories and pre-war Poland. The administrative division of Poland almost perfectly reflects the division into the Western Territories and pre-war Poland. The Western Territories include the following voivodeships (NUTS-2 regions): Zachodniopomorskie, Lubuskie, Dolnośląskie, Opolskie, and Warmińsko-Mazurskie. Pre-war Poland includes the following voivodeships: Łódzkie, Mazowieckie, Małopolskie, Lubelskie, Podkarpackie, Świętokrzyskie, Podlaskie, Wielkopolskie, and Kujawsko-Pomorskie. Two voivodeships (Śląskie, and Pomorskie) are not included in either of the two regions, because large shares of these voivodeships belong to both the Western Territories and pre-war Poland. For the cohorts, I calculate the segregation index only when the number of observations in a cohort in a given year exceeds 5000. Therefore, the segregation index is calculated until 2003 for the 1940-1949 birth cohort, and from 2004 onwards for the 1980-1989 cohort. The differences between groups in levels of occupational segregation may be determined by two factors: the differences in the occupational structure of employment (for example, a large share of occu-

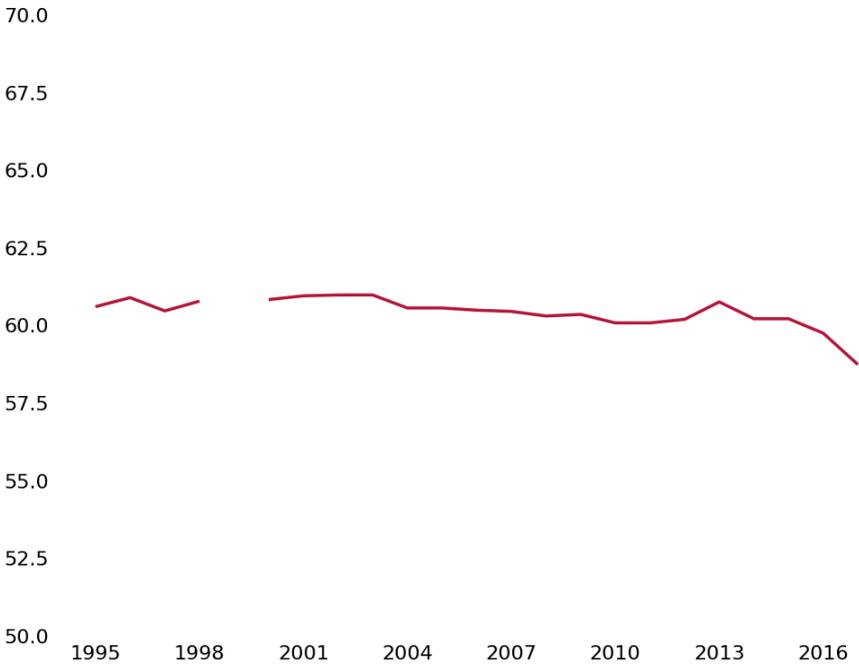
¹There were four changes in the Polish classification of occupations that are used in the Polish LFS: two major changes (in 2003 and 2011) and two minor changes (in 2005 and 2015). The changes in the classification may bias the calculated occupational segregation indices. I deal with this problem in the following way. I assume that the changes in the classification affect only the levels, and not the changes in the occupational segregation indices. Therefore, I shift in parallel the series by the difference between the years immediately before and after the classification change. This approach has two limitations. First, it ignores the changes in occupational segregation between the years immediately before and after the changes in the classification. Second, the changes in the classification may affect not only the levels, but also the changes in the occupational segregation indices.

pations that are highly segregated, such as mining plant operators or nurses) and differences in the levels of segregation within occupations (for example a higher degree of segregation in nursing among younger workers than among older workers).

Results

Occupational segregation by gender in Poland remained relatively stable between 1995 and 2017 (Figure 2). I do not observe any increase in occupational segregation by gender after the transition which may again suggest that the communist authorities were not primarily interested in reducing the level of occupational segregation by gender. Next, I analyse occupational segregation by gender for different birth cohorts, and find that levels of occupational segregation were lowest for the oldest cohort. This result may confirm the hypothesis regarding the variation in gender related content of the official propaganda, because the principle of increasing the number of women in male-dominated occupations was especially salient during the early stages of state socialism in Poland. The findings show that the 1950-1959 and the 1960-1969 birth cohorts experienced much higher levels of occupational segregation. This may be because these co-

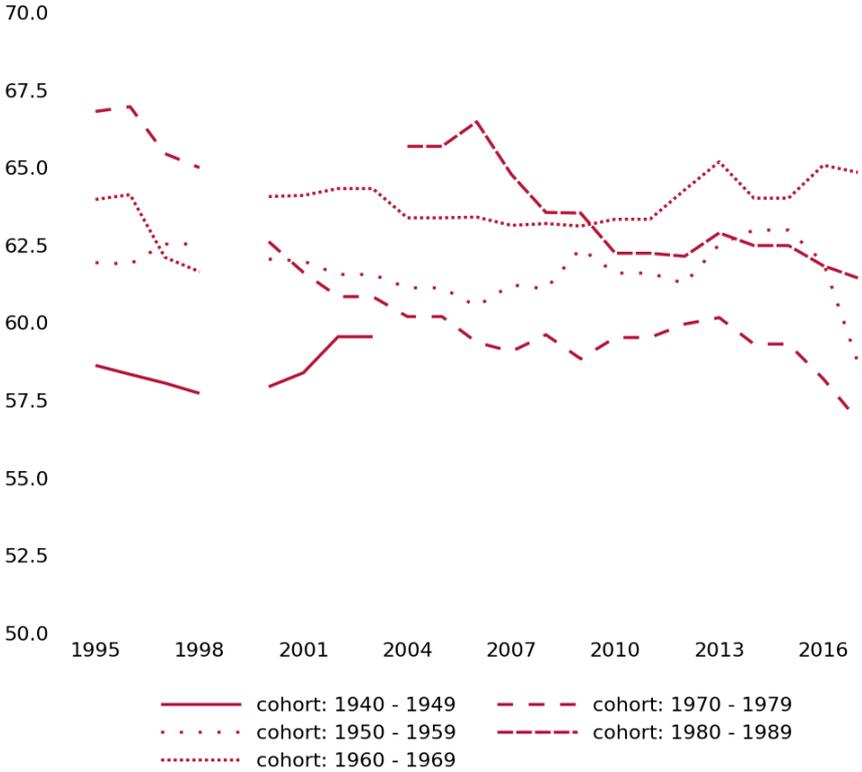
Figure 2. Occupational segregation by gender in Poland



Note. The figure shows the segregation index where 0 indicates no segregation and 100 indicates complete segregation. The sample includes workers in industry, market, and non-market services. The sample does not include workers in agriculture. The data for 1999 is not available.

Data: Polish Labour Force Survey

Figure 3. Occupational segregation by gender in Poland: birth cohorts

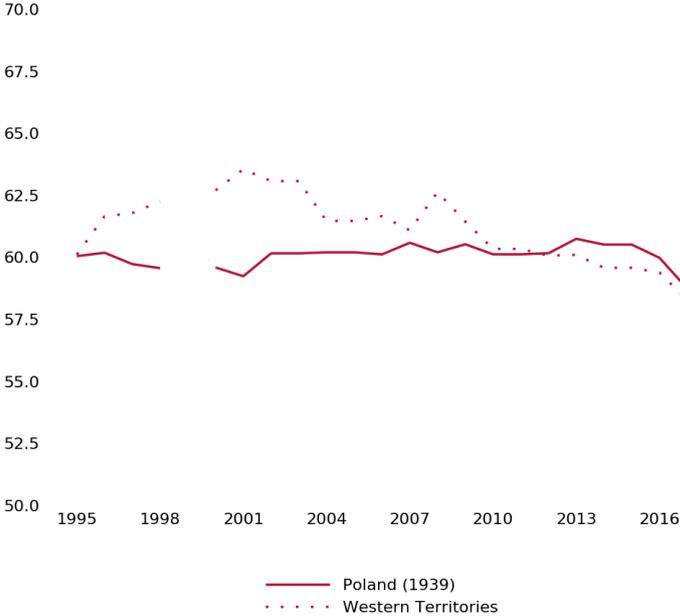


Note. Figure shows the segregation index where 0 indicates no segregation and 100 indicates complete segregation. The sample includes workers in industry, market, and non-market services. The sample does not include workers in agriculture. The data for 1999 is not available.
 Data: Polish Labour Force Survey

Birth cohorts were less exposed to communist propaganda and witnessed mass protests against the communist state. However, I also observe that the 1970-1979 cohort again had low levels of occupational segregation that were similar to those of the oldest cohort. The low levels of occupational segregation found in the 1970-1979 birth cohort may be attributable to the intergenerational transmission of social norms from the 1940-1949 cohort. This may be further confirmed by the fact that the youngest cohort (1980-1989) had very high occupational segregation levels similar to workers born between 1950 and 1969.

Finally, I turn to the regional division of Poland. The occupational segregation index was quite similar in the Western Territories and in pre-war Poland. This rather unexpected finding may confirm the hypothesis that the communist authorities were not primarily interested in reducing the occupational segregation by gender. The initial increase in occupational segregation observed in the Western Territories may be explained by the fact that the region was hit particularly hard by the economic transformation of the 1990s and early 2000s, and thus had unemployment levels that were significantly higher than those in the rest of the country (see Figure 5).

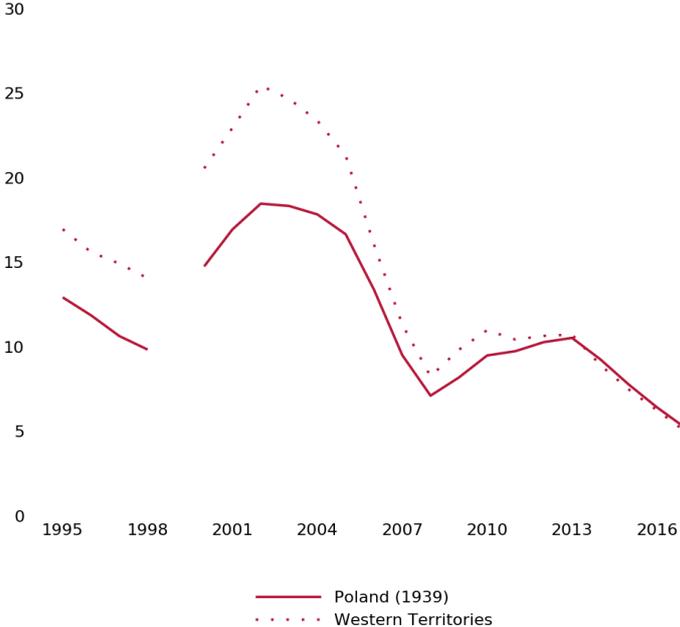
Figure 4. Occupational segregation by gender in Poland: Poland (1939) vs. Western Territories



Note. Figure shows the segregation index where 0 indicates no segregation and 100 indicates complete segregation. The sample includes workers in industry, market, and non-market services. The sample does not include workers in agriculture. The data for 1999 is not available.

Data: Polish Labour Force Survey

Figure 5. Unemployment rate (%)



Note. Figure shows unemployment rate, 15-64 years old. The data for 1999 is not available.

Data: Polish Labour Force Survey

Conclusions

I found that after Poland transitioned to a market economy, occupational segregation by gender did not increase, but instead remained rather stable between 1995-2017. While this result is somewhat surprising, it is in line with studies showing that the gender pay gap did not increase after the transition to a market economy (Adamchik and Bedi, 2003; Grajek, 2003). I also found considerable differences in levels of occupational segregation by gender depending on the birth cohort. The 1940-1949 birth cohort was shown to have lower levels of occupational segregation than workers born between 1950 and 1969. I attribute this pattern both to variation in the gender-related content of communist propaganda, and to a strong rejection of communism by the 1950-1969 cohort, which inspired mass protests against the socialist state, and eventually led to the collapse of communism in Poland.

Finally, I analysed the differences in trends in occupational segregation by gender between the regions that belonged to Poland before 1945 (pre-war Poland) and the regions that were annexed to Poland after World War II (the Western Territories). Levels of occupational segregation were found to be very similar in the two regions. This is a surprising result, given our expectation that the socialist propaganda should have been more effective in the Western Territories because of the absence of existing social structures. The findings of an analysis of changes in attitudes towards women's work and family roles offer an interesting explanation for this puzzling result. At the beginning of the transition, Poles had extremely conservative attitudes towards women's employment with 85% of the population stating that women should take care of the family and home instead of earning money. Thus, it seems that promoting egalitarian norms regarding gender roles was not a priority for the communist authorities in Poland, at least in the late phase of the communist era. This reflects the fact that gender constructions were not homogenous across the communist block, but instead varied considerably across time and countries, from the Bolshevik vision of women's equality in the 1910s and 1920s to the extremely traditionalist approach in Ceaușescu's Romania (Goldman, 1993; Johnson and Robinson, 2006). Moreover, as a state's official propaganda was seldom reflected in its real actions, women's situations were often not improved in practice (Einhorn, 2002; Goldfarb, 1997; LaFont, 2001).

To conclude, I found that levels of occupational segregation by gender in Poland were relatively stable over almost three decades after the transition to a market economy. The cohort differences in segregation levels suggest that the fostering of women's empowerment by the communist authorities was limited to the early phase of the communist era. This observation is further confirmed by the very conservative attitudes towards gender roles at the beginning of the transition. The results also suggest that these conservative attitudes towards gender roles are largely attributable to the reluctance of the communist state to promote

more egalitarian norms, rather than to the strong resistance of a conservative society to communism. If the latter was the case, we would expect to observe differences in the segregation levels in the Western Territories and in pre-war Poland, since the Western Territories had no existing social structures at the beginning of the communist era, and thus were more susceptible to communist propaganda. I found no such differences, and I also detected no differences in the social attitudes towards women's work and family roles in the Western Territories and in pre-war Poland. Moreover, the results show that the share of Poles who believe that women should stay home and not be employed has decreased substantially since early 1990s, despite the strong influence of the Catholic Church after the transition.

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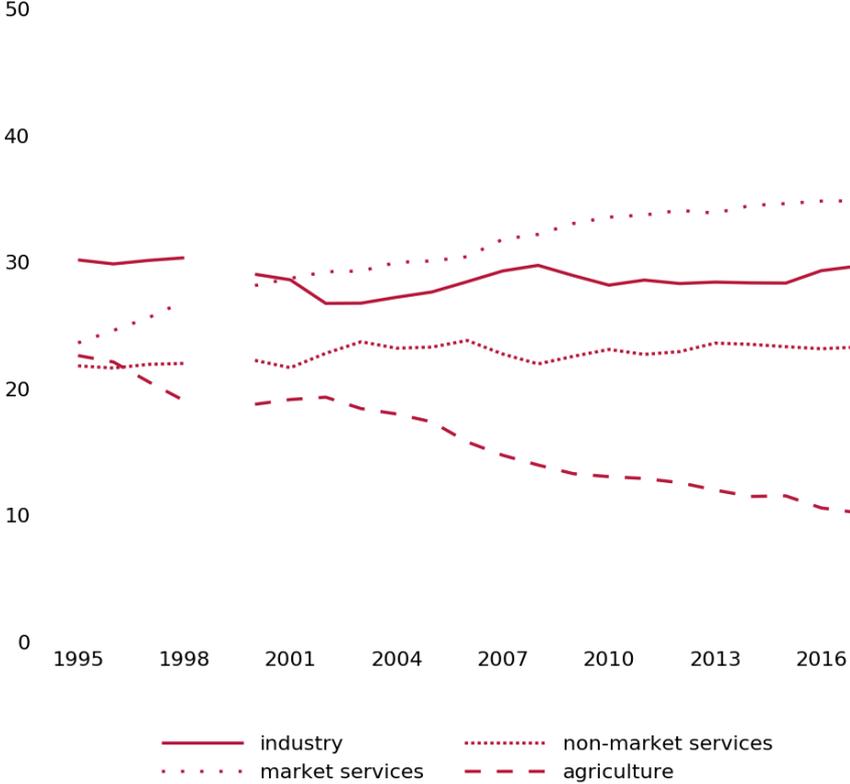
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Appendix A Occupational segregation by gender and structural changes after the transition

After the transition to a market economy, Poland experienced significant structural changes, with agriculture declining in importance, and the role of market services increasing (see Figure A.1). Potential differences in the initial employment structure and in the post-transition structural adjustments could affect the comparison of occupational segregation by gender in the Western Poland and in pre-war Poland. This is because occupational segregation by gender varies substantially depending on the sector, with industry having the highest levels of occupational segregation and agriculture having the lowest levels of segregation (see Figure A.2).

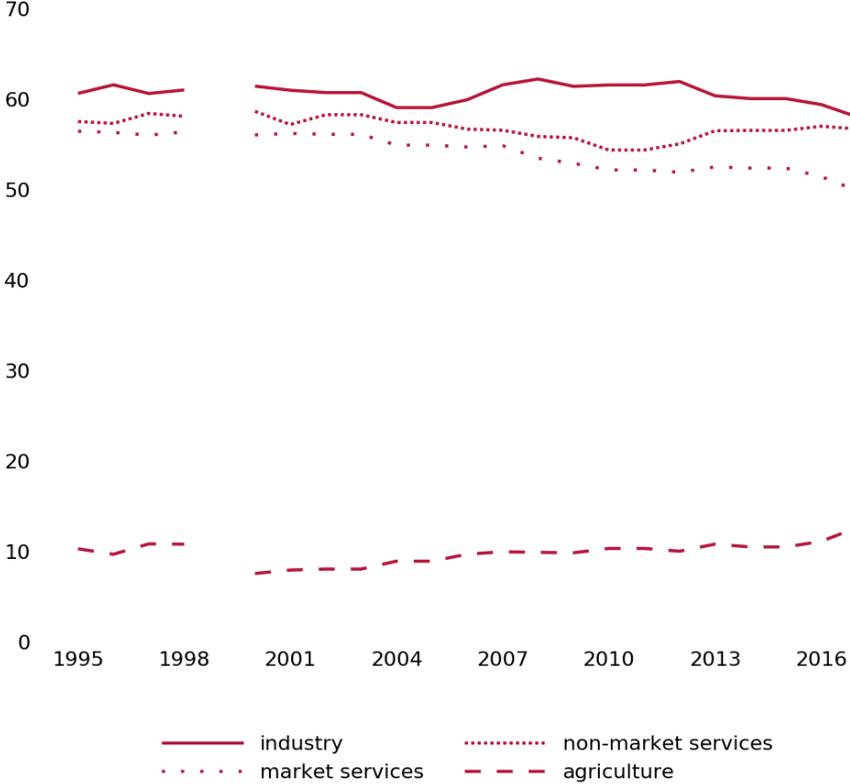
However, the only factor that distinguished the employment structure in the Western Territories from the employment structure in pre-war Poland was the initial role of the agricultural sector. In 1995, agriculture accounted for nearly 30% of total employment in pre-war Poland, a share that was twice as high as the share in the Western Territories (see Figures A.3 and A.4). I excluded the agricultural sector from my analysis to ensure that these differences did not affect the results. The relative importance of the remaining sectors was very similar in both regions, and changes in the employment structure also followed a similar pattern. Additionally, I calculated within-sector occupational segregation by gender for both regions. If the communist authorities had affected levels of occupational segregation by gender through the promotion of egalitarian gender norms, we should see differences in the sector-specific levels of occupational segregation. Nevertheless, I found no clear differences in the sector-specific levels of occupational segregation by gender in the Western Territories and in pre-war Poland (see Figures A.5 and A.6).

Figure A.1. Employment by sector (% of total employment)



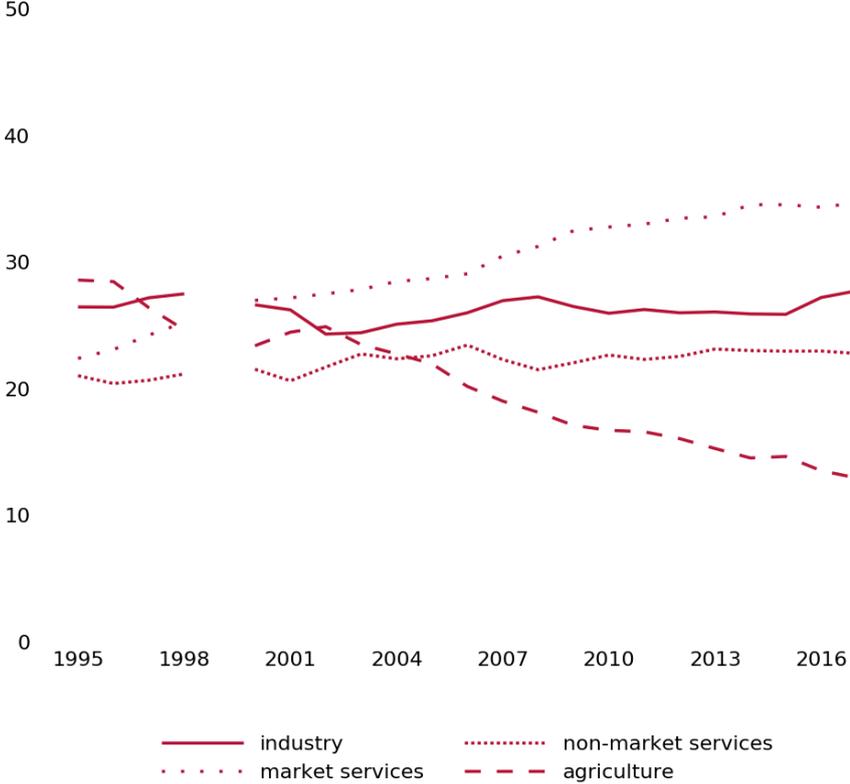
Note. Figure shows employment by sector as % of total employment. The data for 1999 is not available.
Data: Polish Labour Force Survey

Figure A.2. Occupational segregation by gender in Poland: sectors



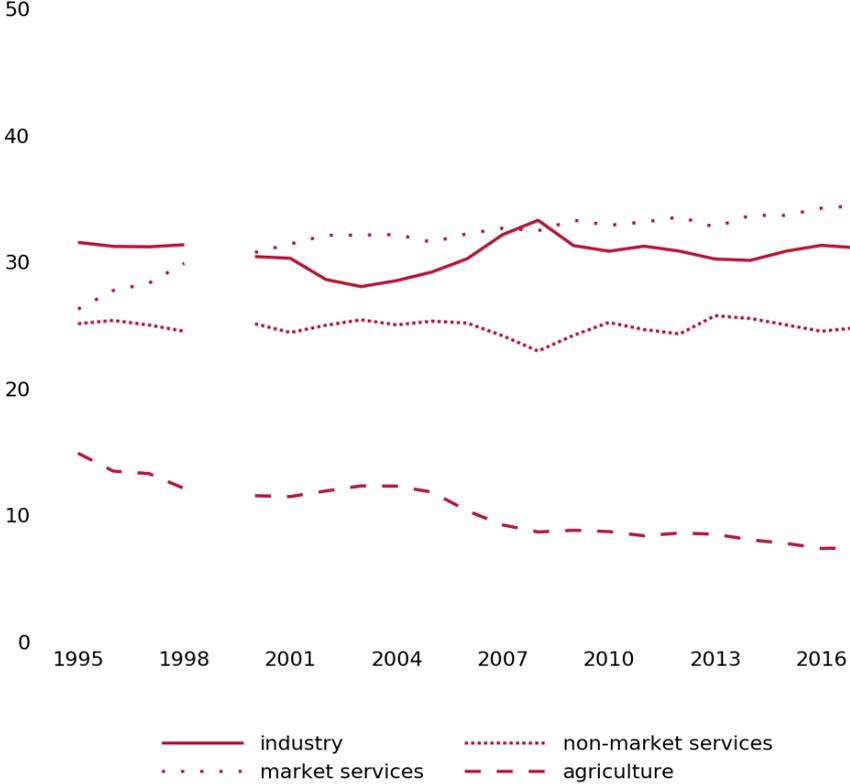
Note. Figure shows the segregation index where 0 indicates no segregation and 100 indicates complete segregation. The data for 1999 is not available.
 Data: Polish Labour Force Survey

Figure A.3. Employment by sector (% of total employment): pre-war Poland



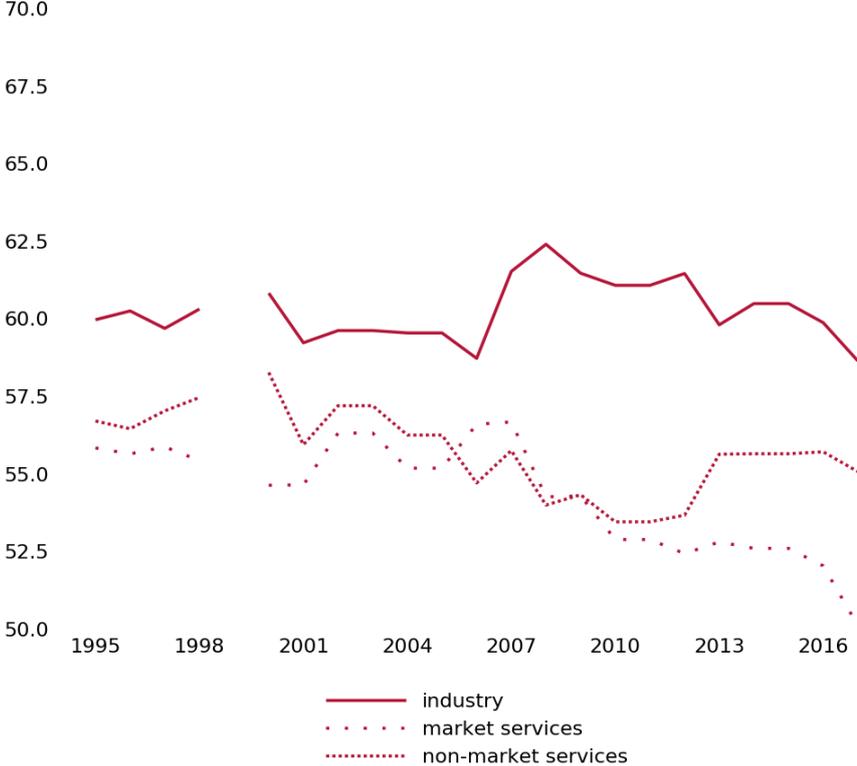
Note. Figure shows employment by sector as % of total employment. The data for 1999 is not available.
 Data: Polish Labour Force Survey

Figure A.4. Employment by sector (% of total employment): the Western Territories



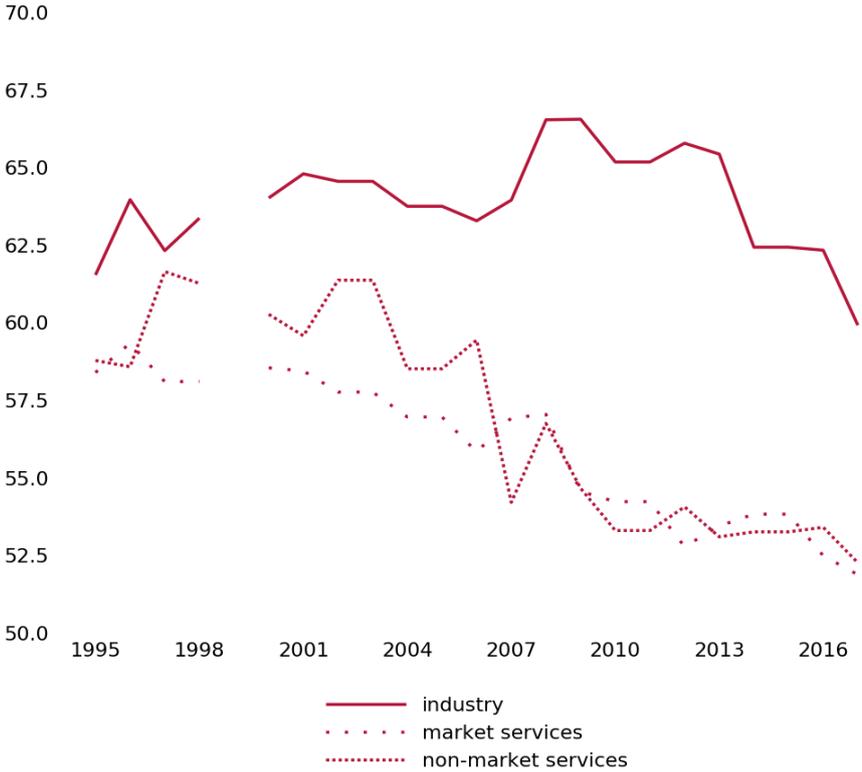
Note. Figure shows employment by sector as % of total employment. The data for 1999 is not available.
 Data: Polish Labour Force Survey

Figure A.5. Occupational segregation by gender in pre-war Poland: sectors



Note. Figure shows the segregation index where 0 indicates no segregation and 100 indicates complete segregation. The data for 1999 is not available.
 Data: Polish Labour Force Survey

Figure A.6. Occupational segregation by gender in Western Territories: sectors



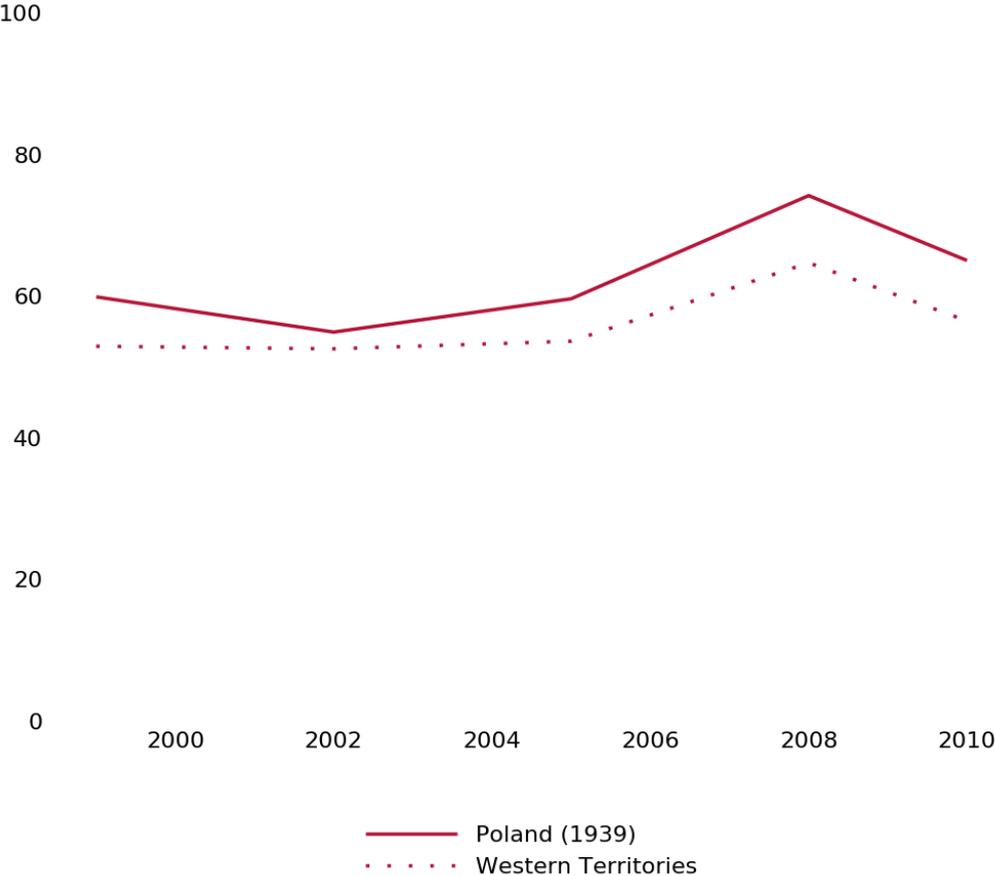
Note. Figure shows the segregation index where 0 indicates no segregation and 100 indicates complete segregation. The data for 1999 is not available.
 Data: Polish Labour Force Survey

Appendix B Social norms after transition

The opposition to free choice in abortion was consistently higher in pre-war Poland than in the Western Territories (see Figure B.1)². This finding may be attributed to a higher susceptibility to communist propaganda in the Western Territories. However, no such differences in attitudes towards women’s family and work roles could be observed (see Figure B.2).

²It is impossible to show consistent results for the years 1992-1997 because of the administrative reform, which took place in 1997. Before 1997, voivodeships did not reflect the division of Poland into the Western Territories and pre-war Poland. Moreover, it is impossible to create a direct crosswalk from the old voivodeships to the new voivodeships.

Figure B.1. Public opposition to free choice in abortion



Note. Figure shows % share of respondents, who responded "no" to the following question: "should it be possible for a pregnant woman to obtain a legal abortion if the woman wants it for any reason?". The solid line plots the attitudes in pre-war Poland and the dotted line plots the attitudes in the Western Territories.

Data: Polish General Social Survey

Figure B.2. Public support for traditional women's family and work roles



Note. Figure shows % share of respondents, who agree with the statement: "it is much better for everyone involved if the man is the achiever outside the home and the woman takes care of the home and family". The solid line plots the attitudes in pre-war Poland and the dotted line plots the attitudes in the Western Territories.
Data: Polish General Social Survey



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