

Work-life instability and life-course income volatility. An age-cohort analysis of the stratified economic penalty of de-standardized work trajectories in Germany and the UK

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Abstract

A vast amount of literature, in the last decades has dealt with the issue of ‘individualization’ versus ‘de-standardization’ of life courses, the ‘determinants’ of such trend and the associated inequality consequences. Such debate has enlisted the role of the ‘classical’ drivers of social inequality – among which occupational class – increasingly reduced or even depleted leaving room to individualized flexibility and insecurity. By retracing the historical labour market transformations, this paper investigates the presence of an economic penalty associated with employment volatility and ‘fuzzy careers’ and the macro and micro determinants of such situation. In detail, we ask to what extent the income penalty associated with work instability evolved across birth cohorts, comparing Germany and the United Kingdom: a coordinated, dualized market economy that experienced institutionally driven labour market flexibilisation and a strongly liberal and widely deregulated one. We do so by leveraging prospective panel data and performing an age-centred income comparison that employs a measure of work-career instability meant to capture employment, contractual, and occupational volatility. Our results show how the classical determinants of social stratification - social class in first place - still matter in stratifying occupational and economic instability and the associated phenomenon of life-course income volatility, with the working class still representing the most disadvantaged one across birth cohorts and over the life course. Institutional and contextual specificities are of primary importance in differentiating the changes in the relationship between employment career and life-course income security as well as in identifying the characteristics of the groups mostly at risk of occupational instability and economic insecurity.

1. Introduction

Structural and institutional changes encompassing advanced Western economies over the past decades are responsible for strengthening already existing socioeconomic disparities and growing levels of income inequality (Bol & Weeden, 2015; Buchholz et al., 2009; Mills & Blossfeld, 2013). A mechanism through which processes of de-industrialization, global competition, and labour market restructuring have impacted socioeconomic insecurity and inequality is the growing *differentiation* of employment life courses (Brückner & Mayer, 2005). These macro-level transformations have fuelled an ongoing debate around the *de-standardization* of individuals' life courses: Life course phases, life events, and individuals' social roles are increasingly expected to intermingle and to diversify across social groups, with a reduced influence of institutionally originated formal and informal paths. While post-modern approaches (Bauman, 2013; Beck, 1992, 2019; Beck & Beck-Gernsheim, 2002) tend to present modern life courses as totally individualized and unaffected by previous social and structural determinants, other approaches tend to stress how post-industrial life-courses, although increasingly dis-aligned, nonetheless are still shaped by structural mechanisms of social inequality, among which social class plays the lion's share (Barbieri & Gioachin, 2022; Brückner & Mayer, 2005; Mayer, 2004a, 2004b; Mayer & Hillmert, 2003; Scherer et al., 2007).

In the recent decades, the literature devoted to evaluating the degree of non-standard and unstable trajectories across contexts, cohorts, and social groups has flourished, often re-focusing on the diffusion of "economic insecurity", alleged to have increasingly affected mid and upper classes. However, there is still mixed consensus in the evidence, as different analytical approaches, temporal periods, and institutional contexts have been employed. While recent studies – which however focused on older, "fordist", birth cohorts in Europe - concluded that there have been few changes over generations (Möhring, 2016; Van Winkle & Fasang, 2017), national specific analyses point to greater variability in employment and family trajectories for young-adults of more recent cohorts, socially stratified around sex and socioeconomic position and depending on the influence of the national specific institutional arrangements.

This paper aims to shed light on the economic inequality implications of the process of work-lives de-standardization, thus clarifying whether, where, and to what extent differentiated working trajectories are amongst the sources of socio-economic disparity across social strata – and if traditionally stable social positions are more at risk of occupational insecurity and subsequent economic volatility, compared to both previous cohorts and lower social strata. Albeit a few attempts, in fact, a systematic assessment of the impact of employment instability on economic outcomes and its stratification along time, is still missing. Our contribution aims at filling this gap by evaluating the

evolving role of work-life instability¹ in shaping individual-level life-course income insecurity and its association with social stratification. We do so by looking at income insecurity at different ages and over cohorts, in different institutional contexts. Specifically, we compare individuals born from 1950 to the 80s who entered the labour market during the years 1970-2000, a period characterized by a series of relevant labour market changes. We follow these individuals during their work-lives observing their different labour market statuses, earnings, and life-course steps, at different ages. Ageing, in fact, could either reinforce initial disparities via a process of cumulative disadvantages or level them out due to increasing occupational maturity and economic stability (DiPrete & Eirich, 2006; Kratz et al., 2022)

Institutional settings represent the macro, contextual, milieu differentiating individuals' life courses and the associated distribution of economic inequality (Kohli, 2007; Mayer, 2009). More in detail, we look at the role of *labour market regulation* and the amount of *welfare decommodification*. For this reason, we compare an open, liberal, and traditionally scarcely regulated country like the UK and a corporatist and coordinated context, like Germany, 'recently' deregulated 'at the margins' (Brady & Biegert, 2017; Hall & Soskice, 2001), looking at the association between work instability (due to labour market (de)regulation) and income insecurity (affected by welfare decommodification) before and after social transfers.

This work is informed by and speaks to the life-course literature, the study of income inequality and social stratification. While the existing stratification research either focused on single dimensions of life-course instability or on specific triggering events (Barbieri et al., 2015; Barbieri & Bozzon, 2016; Vandecasteele, 2011) no attempt to provide a systematic evaluation of the impact of instability of employment trajectories on life-course income insecurity has been made yet. To maximise sample numerosity of more recent cohorts, we leverage prospective data to apply a simplified *age-centred regression approach* (Sabelhaus & Walker, 2009). For each step in the 30-50 age span, we select and compare individuals with (at least) antecedent seven years of observations, thanks to which we reconstruct individuals' medium-term work history 'up to (that) specific age'. This dynamic setting enables us to integrate recent methodological advancement and implement a synthetic measurement of accumulated work trajectories focused on the degree of instability that simultaneously accounts for multiple dimensions such as status, contract, and occupational mobility. In the following, section 2 addresses the concept of *life course de-standardization*, the existing evidence, and the potential economic implications. We hypothesise how the influence of unstable work trajectories on income

¹ Following Bruckner and Mayer (2005) we should talk about *differentiation of the work-life* of individuals, thus referring to a "process where the number of distinct states or stages across the lifetime increases". We opt for using "work-life instability", which refers to a more general trend of changes in occupational and LM statuses. To skip repetitions, we will also use 'work trajectories' as synonym.

disparities is evolving, in two institutional contexts different per labour market regulation and welfare decommodification, at different ages and over birth cohorts, occupational class, education and sex. Section 3, then, describes the employed datasets, the applied setting, the identification strategy to operationalize work-life instability, and the statistical methods. Section 4 shows descriptive and multivariate results, while section 5 introduces a decomposition of inequality dynamics. Discussion and conclusions follow.

2. Theoretical background

2.1 Are work-lives increasingly de-standardized?

During the decades of the ‘fordist equilibrium’ individuals’ life courses became progressively standardized and life phases, both in the work and family realms, smoothly distributed along age (Brückner & Mayer, 2005; Levy, 2013; Mayer & Müller, 1986) thanks to their reduced heterogeneity and the significant welfare effort in buffering negative life events. Stable (lifetime) employment trajectories were associated with growing social rights, income security and generous family wages which, in turn, fostered early (and stable) marriages and higher fertility (Billari & Liefbroer, 2010). The main differences in life-course trajectories and patterns were thus observable across contexts and depending on the normative and organizational influence of national institutional arrangements (Mayer, 2004a, 2004b; Möhring, 2016).

In recent decades, though, several macro factors are undermining the traditional stability of life course trajectories. Global competition, offshoring and technological unemployment, de-unionization, reduced chances of long-life stable careers characterized by secured occupational mobility, while the increase in flexibility and contractual precarity boosted by the process of labour market deregulation threatened previously stable work trajectories, increasingly replaced by more uncertain work histories also in institutional contexts hitherto taken as ideal-cases of steady and secure equilibria (Barbieri, 2009; Breen, 1997; Buchholz et al., 2009; Kalleberg, 2011; Oesch, 2013). Sociologists began questioning to what extent individual paths are deviating from the predictable standard, cumulative, courses and becoming *de-standardized* (Brückner & Mayer, 2005). Thus, scholars refer to increasing age dispersion in the occurrence of life transitions, less interdependence between states, attributes, and events in different realms, with specific trajectories increasingly differentiated and experienced by smaller and stratified portions of the population.

Other authors have interpreted these social changes in terms of a post-modern, non-linear process of *individualization* (Bauman, 2013; Beck, 1992; Beck & Beck-Gernsheim, 2002; Savage, 2015). According to this view, the breakdown of consolidated social trajectories and life course models results in greater freedom of choice for individuals who can design their careers, their family arrangements, thus building their own individual identities with greater degrees of freedom and independently on ‘modern/industrial’ structural constraints as class, gender roles or social status. The move to postmodernity, however, is also supposed to mean more social instability and insecurity and, due to shorter and unplannable work careers, less stable life-courses, and reduced welfare state security in hard times. Individualisation is thus the other side of self-hood reflexivity in the ‘neoliberal order’, combining freewheeling consumer sovereignty with rising uncertainty in a highly competitive and relentlessly harsh social and economic environment increasingly affecting not only marginal social positions but also mid and high social strata (Ranci et al., 2021).

In the last decades, there has been an increase in the empirical efforts to evaluate the degree of de-standardization vs individualization of individuals’ work trajectories, and to identify the ‘losers’ of that process. The evidence is somewhat mixed, as different focuses, operationalisation, contexts, and sampling criteria led to different conclusions. Past works restricted the focus on specific ‘classic’ life events (i.e. educational completion, first job, marriage, first child) and analysed the evolution of the age dispersion in a population and the changes in the co-occurrence of these events (see Brückner & Mayer, 2005; DiPrete, 2002; Mayer, 2004b; Mayer & Hillmert, 2003). Further, most of these past studies limited their focus on today’s old-aged individuals of older, industrial, birth cohorts, which have only been marginally impacted by the discussed societal changes. Limiting the analysis to the birth cohorts who entered the labour market in a period of growing economic prosperity and employment stability (as in Van Winkle and Fasang 2017, 2021), is somewhat useless if the aim is to explore the occupational instability consequences of the processes of continental EU-wide labour market deregulation following the end of the fordist ‘golden age’. Mayer and colleagues (2010), analysing 1929-1971 birth cohorts in West Germany – thus not exactly the best sample of post-industrial employment trajectories – yet report evidence of rising unwanted career interruptions in younger cohorts with a related increase in indirect occupational mobility – that is occupational changes that take place after an employment interruption. Lersch and colleagues (2020), correctly extending the observed birth cohorts for the same West Germany, find a significant rise in occupational volatility for the youngest labour market entrants.

Scholars thus converged in studying individuals’ trajectories more systematically, either through more data-driven explorative analyses and related measures (e.g., dissimilarity, sequence clustering) or by implementing comprehensive measures that convey aggregated information on the trajectories’

stability and heterogeneity - e.g., the turbulence, entropy, volatility, complexity or the precarity indexes (Gabadinho et al., 2011; Manzoni & Mooi-Reci, 2018; Ritschard et al., 2018; Studer et al., 2011). Recent works found that, besides across cohorts, clear differences in occupational instability can be found between sexes (with women showing higher instability), educational levels (with tertiary educated having more complex but not necessarily more unstable trajectories) and especially across contexts, thus remarking the strong role of national institutions in shaping work trajectories (Hollister, 2011; Ramos, 2019; Riekhoff, 2022; Riekhoff, 2021; Struffolino & Raitano, 2020; Westerman et al., 2021). Concluding, life-course trajectories appear increasingly de-standardized and complex amongst younger cohorts, particularly where labour market dualization hit the most. However, non-negligible differences among countries, age steps, and socially stratified social groups can be observed: differences which we should account when investigating the relationship between unstable work-lives, life-course income insecurity, and social inequality.

2.2 The economic implications of work instability

A work trajectory is considered unstable and de-standardized to the extent that it is different from a coherent progressive ordering of jobs with smooth transitions from education to work, prolonged firm tenure and marked by episodes of upward occupational and earnings mobility. This ideal-typical trajectory is decreasingly experienced by most of the workforce, but we know that career breaks, spells of unemployment, repeated episodes of contractual precarity, and downward mobility are not only detrimental to income security but also stratified according to individual attributes and institutional arrangements (Gangl, 2006; Manzoni & Mooi-Reci, 2018). Scholars point to less skilled and lower occupational classes as the most exposed to these negative situations (Barbieri, 2009; Gebel & Giesecke, 2011, 2016; Goldthorpe & Mcknight, 2006; Westhoff et al., 2022). Moreover, the reviewed works on the stability of work trajectories from a life course perspective so far missed a detailed account of contractual conditions, while only few studies considered the contrast between full-time and part-time employment. Exposure to contractual instability is central in negatively differentiating individual trajectories across birth cohorts (see Fauser, 2020; Kalleberg, 2011; Witteveen, 2017). Fixed-term contracts may represent respectively steppingstones to permanent positions or traps into less secure, underpaid, occupations, while part-time jobs may represent either work-home flexible arrangements that allow for more women at work or gender segregated disqualified occupations (Barbieri et al., 2019; Bentolila et al., 2019; Mattijssen et al., 2020; Mooi-Reci & Ganzeboom, 2015; Nightingale, 2020). Recent evidence is consistent with the picture of earnings penalties of atypical contracts (Westhoff, 2022). Finally, also the experience of shorter job-

tenures, rapid job shifts, and downward occupational mobility is associated with work instability and reduced earnings (Fauser, 2020; Manzioni et al., 2014; Western et al., 2012).

2.3 The macro scenario: Institutions and the returns to instability

Contextual features and their historical transformations are claimed to diversify the timing and meaning of life transitions, their social stratification, and the protection against life course risks (Becker & Mayer, 2019; Kohli, 2007; Mayer, 2004b, 2004a). We specifically contrast Germany and the United Kingdom as ideal-types of opposed institutional features expected to moderate the levels of work-life instability and its socioeconomic impact across social groups. More in specific, the Skill Regimes approach (Estevez-Abe et al., 2001) conveniently links trajectories' (in)stability to the interaction between the welfare state, labour market regulation, the characteristics of the educational and training system, and the kind of skills required to sustain employers' productive and market strategies. Occupational and job mobility appears to be lower in rigid labour and product markets (Gangl, 2003). High employment protection legislation (EPL) strictness may hamper employers' reactivity to market fluctuations, increasing adjustment costs with consequent greater risks and duration of unemployment, especially for workers in the secondary labour market, which act as buffer in times of crisis. The relation between EPL and (characteristics and duration of) atypical careers thus implies that deviations from standard trajectories in rigid labour markets are expected to be associated with greater earnings penalties. Also, the unemployment benefits (welfare decommodification) can influence work mobility dynamics. High wage replacement rates positively increase the length of search unemployment as well as average salaries thus affecting labour market flows. However, in case of a dualization in the access to such services, individuals experiencing unstable work trajectories risk also higher exposure to income insecurity.

Put in context, **Germany** features a quite rigid labour market, a well-structured school-to-work transition, and a generous occupational-based welfare state. Though, this country underwent a process of flexibilisation "at the margins" (Brady & Biegert, 2017; Eichhorst & Marx, 2019) starting from the 90s to the detriment of the career stability of less-skilled workers in low-prestige occupations (usually women). In parallel, its insurance-based unemployment benefits, designed to temper the negative income implications of increased labour market flexibility, are largely confined to long-tenured, full-time insiders with regular contracts and contributions. Finally, while in older cohorts Germany featured a traditional male-breadwinner model, in more recent cohorts, women's employment steadily increased due to the diffusion of various forms of (female dominated) "flexible

jobs”, side by family policies fostering work-family reconciliation (Daly & Ferragina, 2018; Schmitt, 2012). Thus, the German dominant family model still sees women as a partial contributor.

Finally, the **United Kingdom** – or in general, liberal, market-driven countries – has been largely ignored by recent studies. In contrast to Germany, this country features low EPL and higher levels of labour market turnover, lower labour adjustment costs, and low labour attachment to specific firms due to the educational system providing general skills and the highly flexible labour market, which favours high employment rates in a more ‘polarized’ service economy that relies also on routine tasks and general skills.² Moreover, the combination of reduced social protection schemes, fluid labour market and stingy welfare benefits forces individuals (of whatever age) to maximize short-term returns in terms of wage at the expense of reduced job security. This combination, thus, involves higher generalised exposure to work instability, life course risks, and economic insecurity. Moreover, the commodification of family-related services pushes more women in the labour market, compared to Germany, but most of them are, of course, employed in secondary, low paid, insecure jobs.

2.4 The micro scenario: individual stratifiers of economic returns

As emerged in the previous paragraphs, not considering the differentiation of life-course trajectories according to individuals’ characteristics would lead only to a partial comprehension of the changes that occurred across cohorts. Not only do the economic returns attached to individuals’ attributes (like sex or occupational class) compose the so-called permanent component of income inequality (Friedman, 1957), but we also expect that individual attributes moderate the influence of instability in work trajectory on income disparities.

More in detail, birth *cohort* represents a determinant of instable and volatile careers especially in dualized labour markets: The effects of the process of labour market flexibilization concentrate on top of younger labour market entrants, while in already flexible markets age/cohort does not represent such a strong stratifier of occupational volatility, which is more ‘distributed’ across cohorts and age (as Figure 2 will confirm).

Side by cohort, *sex* differences in income returns are evident since the labour market entry and sharpen along with the ageing process. Movements in-and-out of the labour market around the age of the transition to motherhood and the subsequent work instability and determine earnings penalties at later age (Fasang & Social, 2021; Kuitto et al., 2019; Vagni & Breen, 2021). Men instead reach

² The access to tertiary education to gain general skills is however strongly socially stratified (Bukodi, 2021; Pugsley, 2018).

around their mid-age the peak of the working career (Manzoni et al., 2014; Schellenberg et al., 2016) and family formation (Aisenbrey & Fasang, 2017) with more work stability and greater income. *Occupational class* well predicts the exposure to forms of job instability, as well as current and cumulative earning differences throughout the career and the ageing process (Goldthorpe & Mcknight, 2006; Shahbazian & Bihagen, 2022, Westhoff et al., 2022) to the point that scholars account class as a proxy for the aggregated permanent income (Yaish & Kraus, 2020). Side by disadvantages traditionally associated with the employment relations behind social classes, the processes of globalization, technological expansion, and offshoring are contributing to enlarging disparities between occupational groups over birth cohorts. Indeed, these changes are negatively impacting the demand and the labour costs for routine intensive and less-skilled occupations, while positively affecting the economic returns to highly skilled managerial and professional positions (Acemoglu & Autor, 2011). Not surprisingly, scholars report a marked stratification of both earning shares and poverty risks between occupational classes in Europe (Albertini et al., 2020; Gioachin et al., 2020). Finally, *education*, stratifies the impact of work instability on work-life income. Quite obviously, higher educated, as it is for higher social classes, might be more penalized by an unstable career than lower strata (floor effect) as the stakes are much higher, especially in more conservative and rigid arrangement institutional arrangements. Finally, over generations, it is the less educated individuals who are paying the price of structural and institutional transformations, like the workingclass occupations.

2.5 Research Hypothesis

Our first research hypothesis concerns the general negative impact of an instable work life on life course income, compared to a standard employment career. Independently from the specific macro national context of labour market regulation and welfare decommodification and the micro individual characteristics of the unstable workers, we expect that unstable and “individualized” careers come with economic penalties, when market income is considered (**Hyp. 1**).

However, institutional differences – and specifically welfare decommodification - will play a role in sheltering individuals from economic penalties deriving from their work instability. Thus, we expect this to be verified in the German arrangement, while we do not expect that the UK market-based welfare will make a great difference (**Hyp. 2**). On the contrary, a flexible labour market as the UK one, may favour quick re-entry in employment, while a segmented one may require longer queuing in search unemployment.

However, to disentangle who is mainly hit by work instability and when, contextual determinants must be considered in their interaction with individual, micro, characteristics: age-cohort, sex, class, education, and analysed in their evolution - which means considering also micro-determinant age-cohort and country specific interactions.

No ‘one-fits-all’ trend or general hypothesis can be expected, then, to suit each country-age-cohort and relevant micro-determinants combination, including their specific interactions and related evolution. As a general, last, argument we posit that, contrary to what postulated by postmodern approaches to life-course research, classical micro-level stratifiers will have different but significant effects in determining the life-course income outcomes of instable work-lives.

Table 1 summarizes the main propositions on the working-life-income influence of work-life instability and the role of macro and micro determinants.

Table 1. Summary of expected role of work instability (WI) on work-life income penalty in Germany and the United Kingdom

	Drivers of work-life income penalty	Expectations over age and cohorts	Sex differentials	Class differentials	Educational differentials
Germany	<p>High EPL and PMR</p> <p>Dualization in the access to LM and social benefits</p> <p>Flexibilisation on women, young, and the less skilled: women increasingly over-represented in marginal jobs</p>	<p>Stronger and increasing penalty for young LM entrants due to LM deregulation at the margins</p>	<p>Stronger income penalty for women</p>	<p>Greater penalty for lower classes over cohorts.</p> <p>No middle-class penalty</p>	<p>Higher income penalty in DE for tertiary educated individuals</p>
United Kingdom	<p>Greater generalised flexibility</p> <p>Skill based influence of technology, globalisation and offshoring particularly permeable in Liberal context</p>	<p>WI produces lower income penalty than in Germany</p> <p>Stable penalty across age and cohorts (differences primarily between groups)</p>	<p>Higher female LM commodification originates no clear sex-based differences in work-life income penalty</p>	<p>Greater penalty for lower classes over cohorts.</p> <p>No middle-class penalty</p>	<p>Lower income penalty in UK for tertiary educated individuals</p>

3. Data and methods

To answer our hypotheses, we draw on the German Socio-Economic Panel (SOEP) and the combination of the British Household Panel Study (BHPS) and Understanding Society (US) covering the 1984-2019 period in Germany and 1991-2019 in the UK. These two prospective panel datasets comparably survey households and individuals repeatedly over the years with the regular inclusion of refreshment samples. In our case, the use of long-run prospective data surely suffers from a limited observational window, but in comparison to the widely used retrospective data in life course research, the prospective setting minimizes recalling biases and allows to consider young workers of more recent birth cohorts. The sociological literature that has focused on the role of micro attributes and events (and their interaction) in structuring life course paths and outcomes, focused on the “effects” of *single explanatory factors* and their predictive power on the *explanandum*. Contrary to this, we opt for an only *apparently – yet necessary – descriptive* approach (Firebaugh, 2018) that ‘condenses’ in a graphical trend the inequality outcomes resulting from theoretically defined set of micro mechanisms, associated with such trend. So doing, we present a parsimonious and clear representation of the outcomes of multivariate, longitudinal analyses of the economic consequences of interrupted and carousel work-lives.

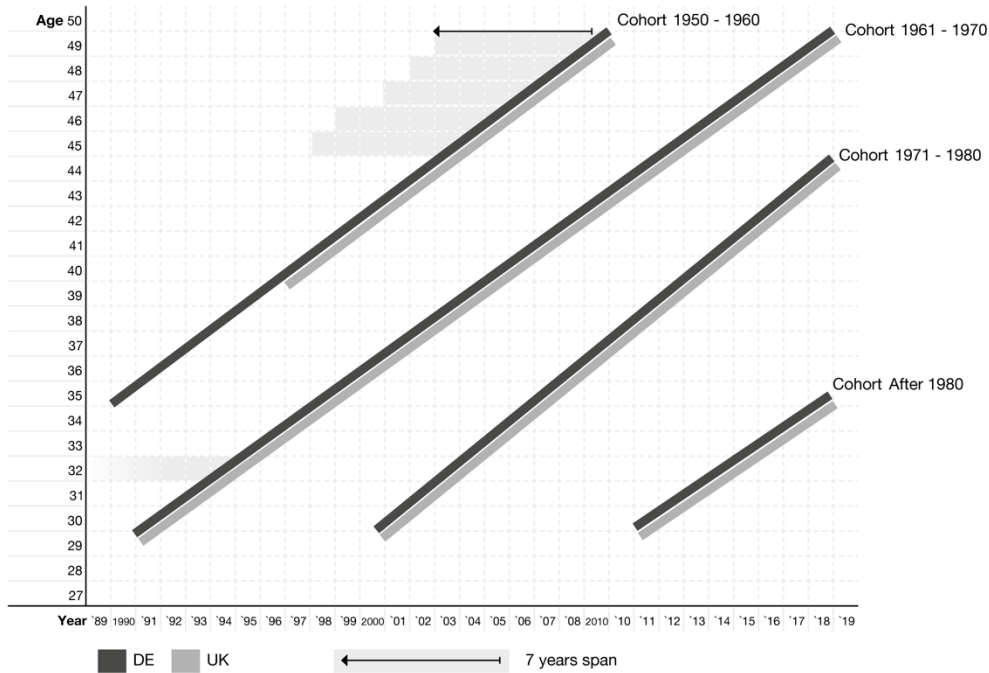
3.1 The age-centered design

To disentangle the differentiated influence of work instability on income insecurity over cohorts and individuals’ life courses, we integrate a dynamic age-centered cross-sectional design. The comparison of age-steps over different birth cohorts allows us to extricate the influence of major societal transformation from ageing/tenure processes, which could vary across cohorts as well. Specifically, we focus on the prime adult age – 30 to 50 – as individuals are expected to already be in the labour market and not close to retirement. Each step in the 30-50 age span composes a singular age-centred cross-sectional sample and gathers individuals who have been followed for at least seven consecutive years up to that specific age.³ Of course, some individuals are present for more than seven years, and the same individuals can be part of several age-centred samples. However, this is not much of a problem as they contribute to estimating separate age-specific analyses while their trajectories have progressed over time. In sum, the main analyses are performed cross-sectionally at each age and we exploit the available longitudinal information to

³ The choice of the seven-years window comes from an evaluation of the trade-off between sample numerosity and estimation precision. Several trials ranging from five up to ten repeated observations have been performed leading to seemingly identical substantial results.

reconstruct prospective individuals' medium-term work history up each specific age. Figure 1 summarises our setting and the available comparability across birth cohorts, while Table A1 and Table A2 in the appendix reconstruct the sample selection process.

Figure 1. The age-centered cross-sectional structure of the data



3.2 A comprehensive measure of accumulated work instability

Work instability is our main independent variable: Much of the reviewed literature investigated the (in)stability of individuals' careers by measuring the degree of accumulated volatility through different statistical indicators (turbulence, entropy, dissimilarity) or via a more elaborated index, as the complexity index (Gabadinho et al., 2011). Whereas this index proved to be a resourceful reference in systematically describing changes in the degree of career standardization, it shows important limitations when it comes to distinguishing positive and negative forms of transitions over the working career.

To get an understanding of this measure and its limits, Equation 1 shows that in each individual trajectory (x), (C) is calculated as the geometric mean of the number of transitions (q) and the longitudinal entropy (h), which refers to the unpredictability of a future state given the already experienced ones. Both the number of transitions and the longitudinal entropy are normalized to assure comparability over individuals, and thus they are respectively divided by the length (l) of the

trajectory minus one and the logarithm of all possible states (a) that an individual can experience. This index reaches its statistical maximum (100) in trajectories with all the possible states, all possible transitions, equal states duration, and minimum (0) when just one single state occurs.

Equation 1

$$C(x) = 100 \cdot \sqrt{\frac{q(x)}{(l_x - 1)} \cdot \frac{h(x)}{\log(n_a)}}$$

where $0 \leq C(x) \leq 100$

Unfortunately, from a social stratification perspective this index risks to oversimplify the qualitative differences in the experience of mobility in terms of transitions in and out of the labour market, changes in the contractual conditions, and, finally, changes in the occupational position.

Some scholars already attempted to overcome these limits by distinguishing and counting negative and positive transitions (Brzinsky-Fay, 2007; Manzoni & Mooi-Reci, 2018) or voluntary or involuntary changes. However, these trials still do not evaluate the degree of instability, and their definition of the potential states the individuals may experience is often limited to a few broad conditions such as the employment status (employed, unemployed, out of the labour market) while few studies considered also the full-part-time distinction (Struffolino & Raitano, 2020).

To overcome these limitations, we elaborate a more refined measure of accumulated instability in work trajectories by building upon the precarity index (Ritschard et al., 2018) but extending the range of working states that individuals can experience.

First, as elaborated (Ritschard, 2021), the precarity index (P) aims at reweighting the complexity index for the (un-)desirability of a working state and a transition. As made explicit in Equation 2 this index includes the (i) degree of instability at the first temporal observation ($a(x_{t1})$), and (ii) a weighting/correction factor ($1 + q(x)$) that penalizes and rewards transitions based on their qualitative order of desirability and their transition probability.

Equation 2

$$P(x) = \lambda a(x_{t1}) + (1 - \lambda) * C(x)^\alpha * (1 + q(x))^\beta$$

*λ : tradeoff between initial state and the reweighted complexity
 α and β : relative importance of complexity and the correction factor*

For each available individual age point, we leverage the antecedent selected longitudinal observation to calculate the respective medium-term accumulated work instability. In contrast to previous works,

we here define a wider range of statuses that enables us to account for both employment, contractual, and occupational instability. First, we split between employment, unemployment, educational spells, parental leaves, and inactivity. Then, we consider whether working individuals are self-employed or employees, and in this latter case the combination of whether they have a permanent or temporary contract and if they work full or part-time. Finally, for each of these combinations, we further split employed individuals according to their occupational level by using quintiles of the International Socioeconomic index (ISEI, Ganzeboom, 2010), thus aiming to capture sizeable volatility in occupational levels. Appendix Table 1 summarizes the employed categorization and the chosen qualitative ordering of their desirability.

As changes in contracts are more likely than sudden jumps in occupational quintiles, we deliberately attributed higher weights to changes in the contractual conditions. Results are comparable even when we invert the order, thus with the contractual condition within each ISEI quintile. When internal gaps in individuals' states were present, we handled missing information by filling forwards absent episodes, but results remain comparable if states are carried backwards or left as missing. Finally, for analytical purposes, we standardize the measure of accumulated work instability to evaluate the implications of a deviation from more standardized and secure working trajectories.⁴

3.3 Defining and studying the dependent variable(s)

We study the evolving influence of work instability over age and cohorts on income insecurity presenting separate analyses (OLS regressions). While the impact of labour market structure and regulation is deducted by the comparison between the two country-cases⁵, to measure differences in the redistributive impact of national welfare states we consider and contrast two income dependent variables: the net labour income and the disposable income after work and family related social benefits *taken at each age step*.⁶ Income disparities in the 30-50 age span often have implications for the overall permanent income and consumption (Shahbazian & Bihagen, 2022). Both variables are

⁴ The different statuses measuring employment, contractual, and occupational instability, are differently present in the two contexts: FTCs for example are much less diffused in UK than in Germany. Nonetheless, all the possible 'cells' deriving by the intersection of the above-mentioned statuses contain enough cases in each country. Moreover, we stress that we are mainly interested in the variations among different "combinations of statuses" over the considered temporal moving window.

⁵ To estimate of the effect of some index as Employment Protection Legislation, Product market regulation and so on, in fact, we should compare a larger number of countries over a long period: unfortunately, international comparative datasets do not allow for long enough longitudinal comparisons of work-lives. This is an insurmountable problem in present social research.

⁶ In constructing the disposable income measure we consider income from work, various forms of social protection, unemployment benefits, and maternity/child related benefits. We thus exclude income deriving from private investments, pensions, and insurances.

log transformed and adjusted for inflation indexed to 2019. Necessarily, these two dependent variables refer to two separate analytical samples. While the disposable income after transfers includes non-employed individuals with positive income at the reference age, the labour income is inevitably restricted to individuals working when income is measured.

Equation 3 defines **age specific log income** ($y_{i,a}$) [of individual i at age a] to be the joint function of accumulated work instability (wi) in the last 7 years, and a series of vectors of stratifications (x) such as sex, education (primary, secondary, and tertiary degree), occupational class, regional position, the family status, composition, the number of children, and the period (3 years dummies).

Equation 3

$$\hat{y}_{i,a} = \alpha + \hat{\beta}wi + \hat{\beta}x + \varepsilon_{i,a}$$

For each age-cohort combination, we report the association between accumulated work instability and individual labour and disposable earnings by reporting the coefficient ($\hat{\beta}wi$) of a z score (a deviation of 1 std.dev.) of our index, net of the mentioned control variables.⁷ Appendix section B reports base models comparing coefficients with and without adjustment for covariates.

The estimations are also performed separately for males and females, and then, separately for occupational classes, and educational achievement. Due to restricted sample size, we operationalize occupational class following the 3 class ESEC (*European Socio-Economic Class*) scheme (Rose & Harrison, 2007), thus with manager and professionals composing the Service class (1), white and blue higher grade collars, together with small entrepreneurs composing the Intermediate class (2), and finally, the lower grade blue and white collar jobs and elementary occupations are gathered in the Working class (3).⁸ As individuals' occupational position may originates instability we deal with possible endogeneity issues by taking this information from the first available year in the 7-year moving window.

⁷ Age-centred econometric approaches have taken hold in economic income simulation and are suggested when the interest is on life-course related differences in the marginal association of specific vectors (Sabelhaus & Walker, 2009). To maximise the estimation precision, though, each age-specific coefficient should be estimated also including ages before and after – appropriately rescaled – to correct for transitory variations. We provide supplementary checks considering income as the 5-years (-2/+2) average around each age. This requirement of additional individuals' observations necessarily implies the loss of several cases and precision.

⁸ Aggregated class schemes appear to reduce occupational-measurement errors in survey data (Houseworth & Fisher, 2020). See: <https://www.iser.essex.ac.uk/archives/esec/user-guide/detailed-category-descriptions-and-operational-issues/six-five-and-three-class-models> for more details.

For the final part of our analytical strategy, we provide an aggregate evaluation of to what extent work instability contributes to jointly explaining the level of **economic inequalities** at different ages between birth cohorts. Specifically, we aim to compare its contribution to social stratifiers such as sex, education, and class, net of the inclusion of the previously mentioned control variables. In this specific analysis, we change the operationalization of occupational class by taking the modal state over the antecedent seven-years range up to the threshold age and we adopt the ESEC 6-class scheme distinguishing (1) Managers and professionals (*the Salaried*); (2) High skilled white/blue jobs (*Intermediate Employees*); (3) Small employers / self-employed; (4) low skilled white-collar jobs (*lower sales and service*); (5) low skilled blue-collar jobs (*lower technical*); and (6) routine occupations.

According to Fields (2003), the variance of log-income $\sigma^2(\ln Y)$ stands as a measure of income inequality jointly defined by observable and unobservable factors. In this line, we perform a Fields decomposition starting from the described income-generating function. As such, we estimate the inequality weight (*iw*) relative to each earnings' determinant factor (*j*) net of the other vectors according to Equation 3:

Equation 4

$$iw_j = \frac{\hat{\beta}_j \cdot cov(X_j, \ln Y)}{\sigma^2(\ln Y)}$$

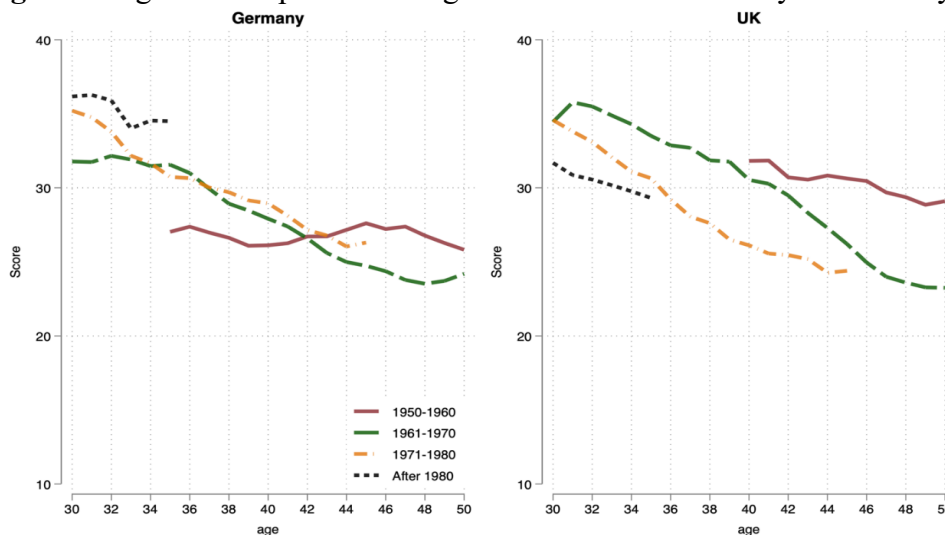
The ($\hat{\beta}$) coefficient of a specific factor obtained by the multivariate OLS is multiplied for [$cov(X_j, \ln Y)$], the covariance between each factor and the log-transformed dependent variable ($\ln Y$), and divided by the variance of the log-earnings [$\sigma^2(\ln Y)$]. The relative weight is expressed as the percentage (0-100) of R^2 explained, while the remaining residual unexplained part ($1 - R^2$) should be regarded as correlated to unobserved factors. Analyses performed using similar methods as the Shapley value approach (Shorrocks, 2013) lead to substantively similar conclusions.

4. Empirical results

4.1 The instability of work trajectories over age-cohorts

A picture of the age-cohort trends in the index of cumulated work instability (ranging from 0 to 100) in Germany and the UK is provided in Figure 2.

Figure 2. Age-cohort specific average score of work instability in Germany and the UK.



Work instability is visibly growing in Germany over cohorts, where a clear age-based pattern emerges since the 1960s cohort, with younger adults markedly more unstable and a progressive ‘re-stabilization’ in later age-steps. On the contrary, the trend is decreasing across cohorts in the UK, where levels of work instability appear high already since the 50s cohort.

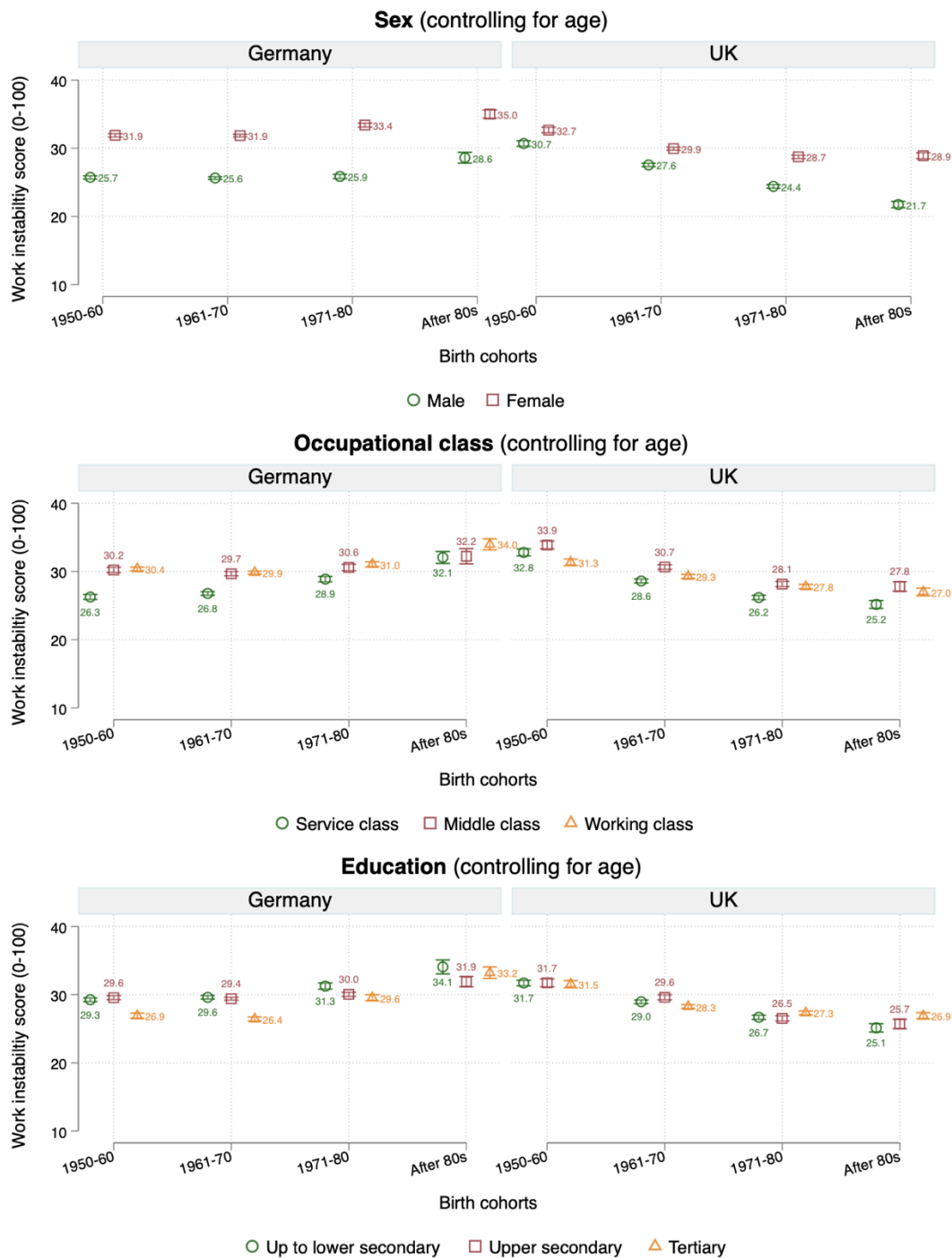
To provide a generalised overview of the differences in the social groups of interest, **Figure 3** reports aggregated results separately for men and women, between Service, Intermediate, and Working classes, and finally between lower, middle, and tertiary educated.

In both contexts, women are more at risk of work instability and both women and men appear overall stable (or just slightly increased) across cohorts in Germany – even though we can consider different age spans. The cohort-trend is, instead, decreasing in the UK. Women always remain more unstable than men, but males experienced a greater decrease in aggregate terms. The opposite trends between Germany and the UK by cohorts, already noted in Figure 2, are reconfirmed once accounting for occupational class and educational achievements.

In Germany, the distinction by classes shows the non-existence of a ‘volatility penalty’ concentrated on the middle (and upper) class: although the service class increased the average exposure (primarily for the age differential across cohorts) working-class members are those mostly unstable over. In the UK, are both the middle and the working class those primarily exposed to work instability. About the

middle classes, and their claimed growing ‘occupational insecurity’, we just remark how even the ’50-’60 middle class cohort was overall as (or more) occupationally unstable as (than) the later ones in both countries. The patterns described for the occupational stratification can be extended as such for the educational stratification.

Figure 3. Cohort specific average score of work instability according to sex, occupational class, and educational achievement – all average scores are obtained after controlling for age dummies



4.2 Work-life instability and its economic penalty

Figure 4 considers the aggregated income penalties (both before and after social transfers) associated with accumulated work instability.⁹ To enhance readability, we smooth age-specific coefficients applying the Kernel-weighted local polynomial function (Fan et al., 1996).

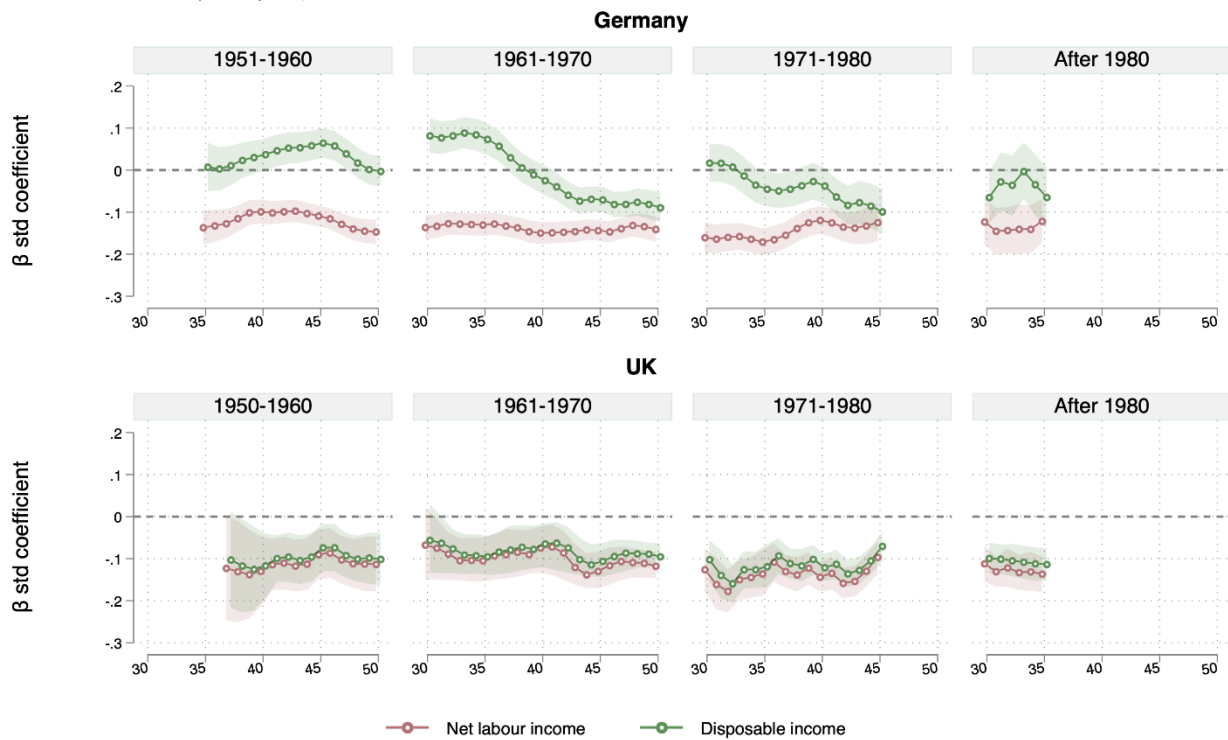
Focusing on the association of work instability on net *market income* (red dots), we see in both countries a marked negative impact on earnings that goes from -10% up to -20% when compared to the average level of trajectory instability, in line with our **Hypothesis 1**. In Germany, we observe a pattern of relative worsening of the impact of career instability on market income across cohorts: notwithstanding a feeble improvement (less negative impact) around mid-age (40-45) for the observable cohorts - however scarcely significant - the overall picture of how work career instability affects *net* work-income ranges from -10-15% for those born in the '50s to -20% for the last cohort. Thus, *age-birth cohort* in a dual labour market represent a significant stratifier when the (market income) impact of labour market deregulation is considered. In the UK, on the contrary, we observe an almost stable negative association across birth cohorts, possibly slightly more negative at a younger stage of adulthood but affected by higher errors.

Looking at the impact of welfare decommodification (via disposable income: green dots), as expected we find an absence of welfare support in the UK, as penalty of work instability on market and disposable income de facto overlap almost entirely.

In Germany, on the opposite, sizeable differences are found when considering the distance between the impact of work instable careers between disposable and market income: the beta coefficients of accumulated work instability (green dots) are not significantly different from 0 – and sometimes even positive for the older industrial birth cohorts ('50s – '70s) - for younger adults in all birth cohorts. Thus, and notwithstanding the growing dualization in the access to social benefits, in line with our **Hypothesis 2**, in Germany the state appears to compensate the income penalty associated with unstable and less standard work careers at earlier stages of the working life. In later adulthood (after the age of 40) and across cohorts, a slightly decreasing buffering role of the state is found. This pattern already emerges for those workers of the '60s-'70s cohort, who reached the age of 40 during the first decade of 2000 and are observed during the years of initial labour market deregulation.

⁹ Models refer for disposable income to the sample of the population at each specific age, and for net labour income to those individuals that are employed at each specific age.

Figure 4. Age-cohort specific association of work instability on log-transformed net labour and disposable income – z-score (1SD) adjusted and smoothed coefficients.



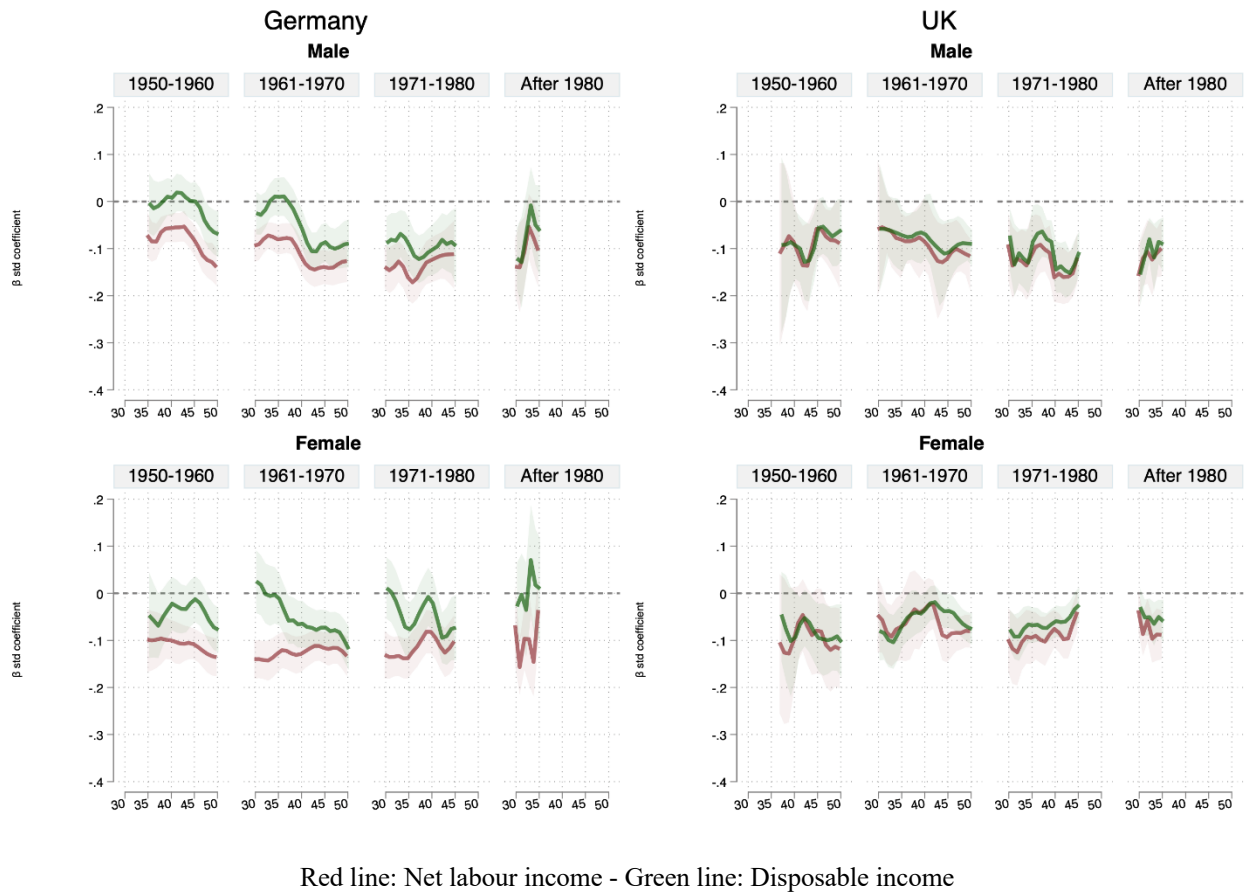
4.3 The heterogeneous impact of accumulated work instability

In this paragraph we will look at the micro factors moderating the impact of work-life instability on market as well as on disposable income.¹⁰

Starting from Germany, the influence of work-life instability on market income (Figure 5) appears to be harsher among women in the early adulthood across all cohorts and specifically for the 50s-70s birth cohorts. In these older cohorts, work instability affects men’s market incomes greater in later ages, when income differences have already cumulated and crystallised. However, no relevant sex differences when considering the impact of work instability on disposable income emerge in these two older cohorts. When we move to the subsequent cohorts (the 70s onward), we find little sex differences in the labour income in the younger adulthood – except a higher protection for female (more atypical) workers on disposable income, for the post 80s cohort.

¹⁰ We present the moderation analyses separately, as the subgrouping would produce combinations of age-cohort-sex-class with too few cases to provide precise estimations.

Figure 5. Age-cohort specific association of work instability on net labour and disposable income – adjusted coefficients and smoothed by sex



In the liberal context, on the opposite, we see a clear trend of penalty for males across cohorts: a trend that generally worsen with age. As already noted, in the UK market and disposable incomes penalties from work instability greatly overlap, with the result that the widening income differences between stable and unstable men's work careers in recent birth cohorts thus point to an exacerbation of market-generated inequalities linked to the transformations of individuals' trajectories, apparently not sufficiently addressed by public transfers. This fits with our **Hypothesis 2**.

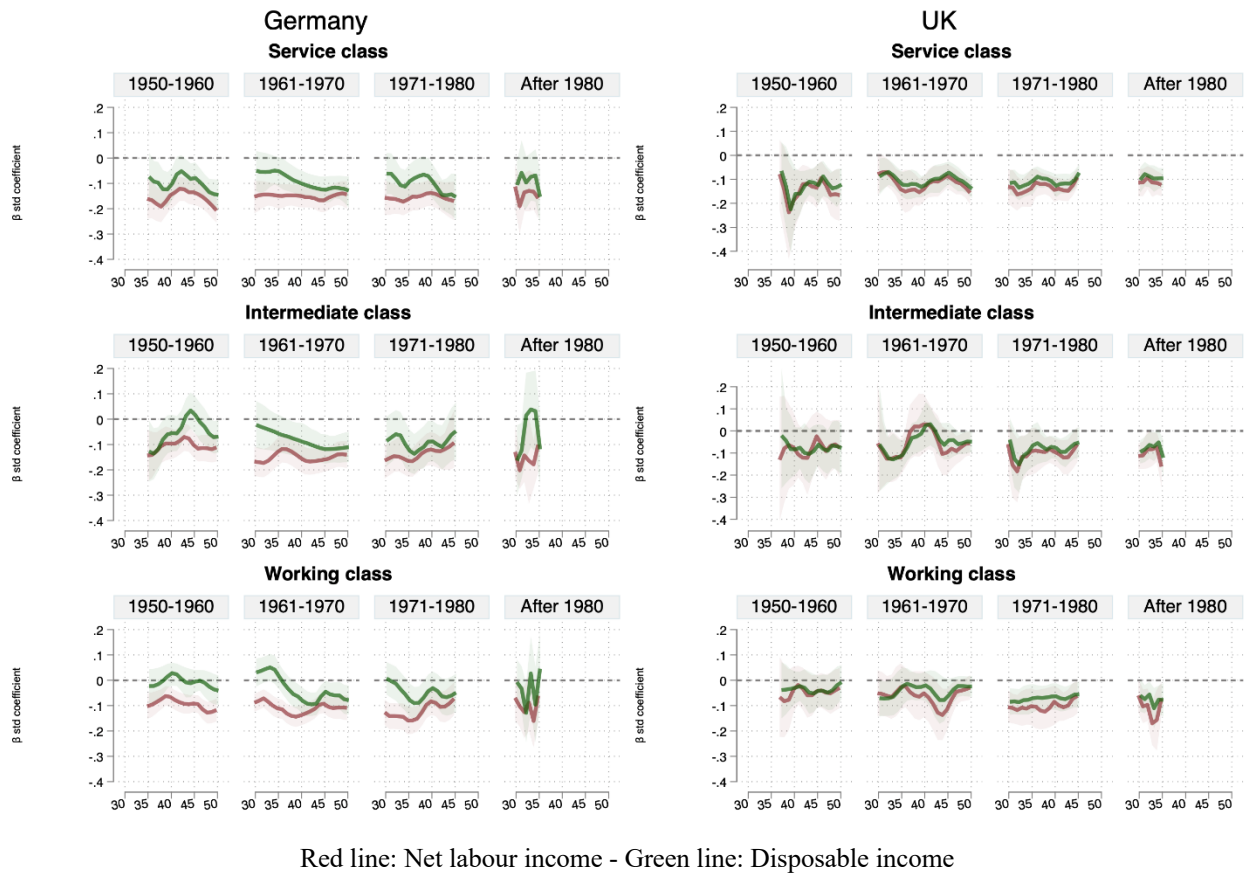
Moving to the differences between occupational classes (Figure 6), notable country specific patterns over birth cohorts emerge. Considering age-cohort changes in Germany, working-class workers in younger adulthood experienced a greater increase in the income penalty, related to the targeting of the flexibilisation on young labour market entrants. This additional penalty for younger cohorts declines at later age stages. To be stressed, however, how for all the considered German birth cohorts, the service class is the most penalised by precarious work experiences - especially in later adulthood, a penalization that involves also disposable income.

This indicates how in a relatively rigid and protected labour market, a deviation from a standard and stable trajectory turns to be particularly detrimental also at higher occupational levels as it can

originate a permanent income scar in the (high class) individuals who 'deviate' from a secure path and limit the access to sufficient benefits to buffer the income disparities. Up to the 1961-70 birth cohort, also the intermediate class is particularly affected by sizeable and not buffered income differences related to work instability. Subsequently (cohort 71-80), labour income differences are still visible in young adulthood (age 30-35), but these disparities shrink when disposable income is taken into exam, as expected.

In the UK, the service class appears to be again the most hit by the income penalty attached to work instability, and this penalty appears to be generally constant over the age steps and birth cohorts – possibly bettering just for the last cohort. Amongst older birth, we observe a proportional lowering in the income differences levels as we consider lower occupational classes. The situation of the working-class, though, significantly worsens over birth cohorts, in line with a trend of growing class differences. Finally, the intermediate classes do not show significant income penalties from work instability in almost all the age-cohort combinations. In middle class occupations, work instability increased, especially amongst women, but apparently without destabilizing the amount of income security of these workers. Thus, our results show quite clearly as – for what concerns the impact of increased work-life instability and volatility on middle classes' market and disposable incomes - no signal of a process of penalization insisting on the middle-class, is found.

Figure 6. Age-cohort specific association of work instability on net labour and disposable income – adjusted coefficients and smoothed according to occupational class

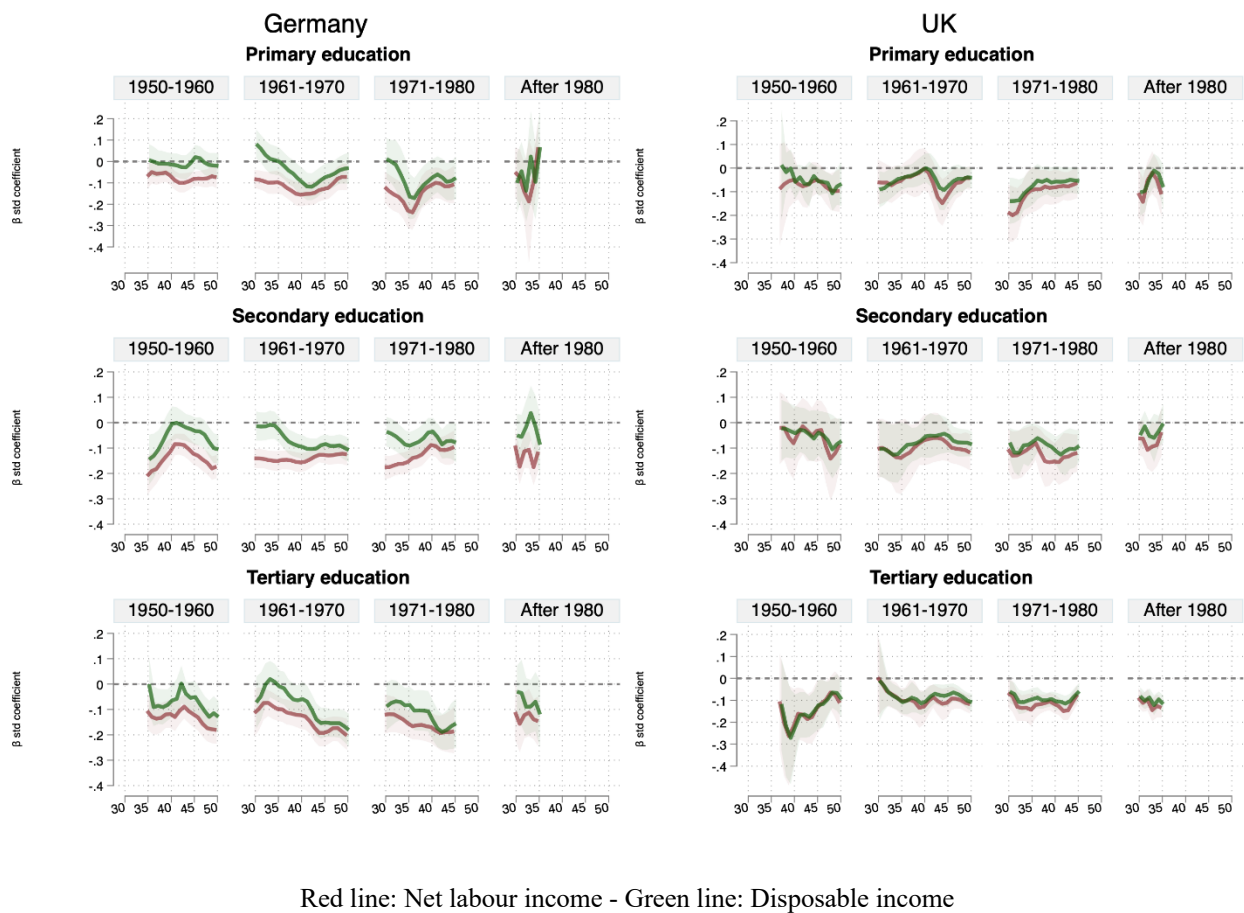


Lastly, Figure 7 reports the association of accumulated work instability on market and disposable incomes, according to educational levels. Briefly, penalty appears quite stable across age-cohorts in the two countries, possibly with a small amelioration in old ages (with one exception).

Low educated are more penalized in DE than in the UK, as the German skill regime better rewards skills and educational qualifications, while in the UK the flexible labour market creates enough job opportunities also for routine workers – and not too badly paid. The same pattern is verified also for secondary educated workers, similarly penalized in the two countries.

Different the situation of high educated workers who – in an industry-based skill regime as the German one – are extremely penalized by an instable and wavering work-life, both across cohorts and age. A similar penalization does not appear in the UK, where the coefficient of work-life instability is about constant – and not too severe – across age and cohorts (if we exclude the - odd enough - trend for the oldest cohort, most likely due to scarce sample numerosity, indicated by the large error terms).

Figure 7. Age-cohort specific association of work instability on net labour and disposable income – adjusted coefficients and smoothed according to education.



5. Decomposing aggregated inequalities

As last contribution, we evaluate the joint role of work-life instability in explaining age-cohort specific economic inequalities, comparing (Figure 8) the share of explained variance of market and disposable income for a series of “stratifiers”: work instability, sex, education, and occupational class - always over age groups and birth cohorts, in the two countries.¹¹

In the left panel, decomposing market income reveals distinct patterns over age and birth cohorts between the two countries. In Germany, the share of inequality explained by our index of *accumulated work instability* (red dots) remains always well below 10% (even less when disposable income is considered). While in the first cohort there is quite an overall stability across age groups, for the subsequent cohorts a clear age gradient is progressively observed, with greater relevance of work instability in explaining inequality in the youngest age groups. This finding is again in line with the

¹¹ Models and reported shares are adjusted for the usual covariates.

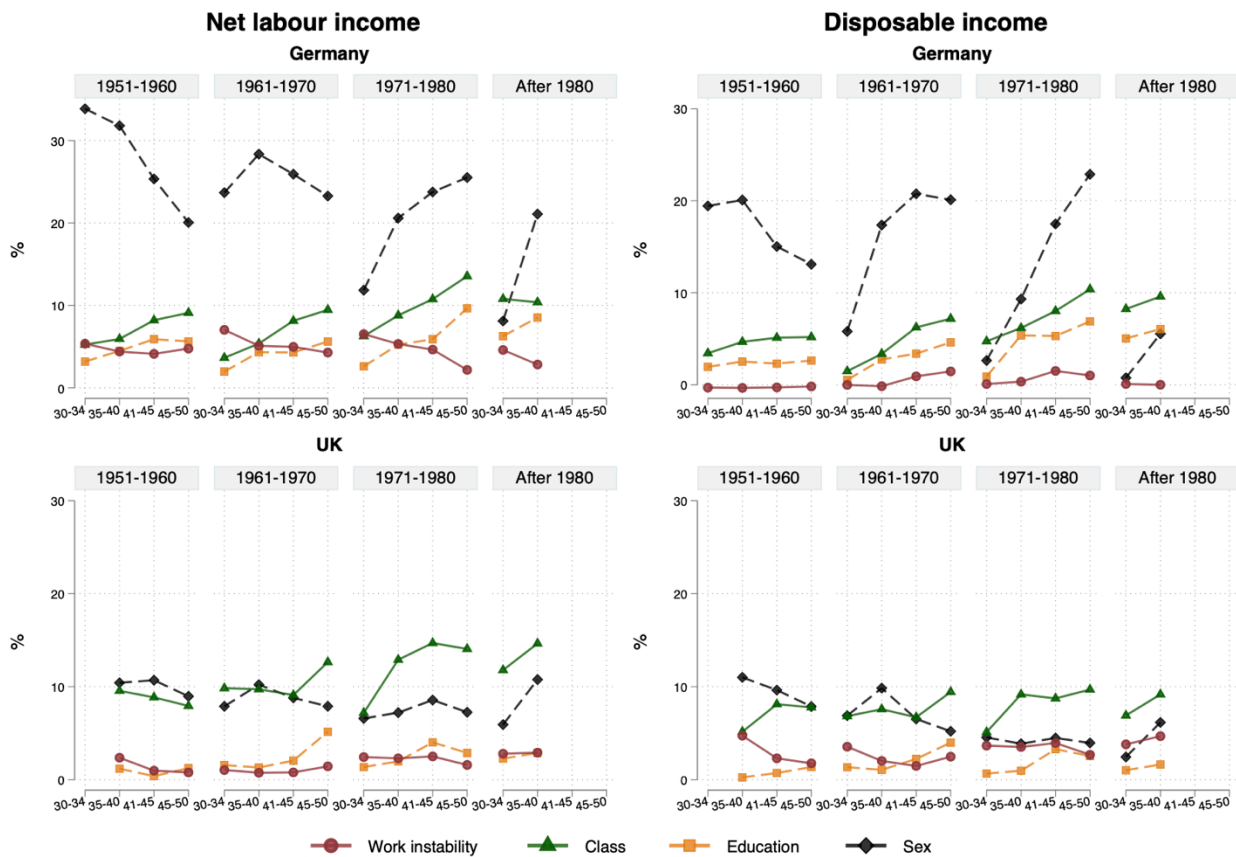
growing labour market and income disparities confined among the more flexible young German workers.

In the UK, on the contrary, the overall levels of penalization due to an instable work career appear overall lower, and scarcely different across age groups. However, in the UK, work instability has raised its negative impact across cohorts since its share increased from $\approx 2\%$ in the 1950-60 cohort up to 4-5% in the last birth cohorts – largely driven by the previously documented growing income penalty for the working class.

Concerning the impact of sex (black diamond) it accounts for the largest share of inequality (around 20-25% in Germany, less in UK $\approx 8/10\%$) but its relevance is progressively reducing over birth cohorts, following a trend in reduction of sex-based wage differentials which has been well described in the literature (Blau & Kahn, 2008, 2017). This holds especially for young women across countries and cohorts, who enter the labour market with higher levels of education and have less interrupted careers. Along with age, sex reveals to be a penalizing factor only in Germany: 50 years old and over, women in Germany suffer from the same level of penalty (about 20%) across all cohorts, and independently from what kind of income one considers: a signal that the insurance-based German system of social citizenship is scarcely protective with these women.

On the contrary, *class* (green triangle) and *education* (orange square) in Germany follow similar cohorts and age patterns, although class always accounts for a higher share of inequality. Specifically, we document that these factors increase their explained share at later age in all cohorts due to a cumulation of disparities between classes (and educational levels) at advanced career stages. Additionally, there is also an overall increase in the levels of these factors over birth cohorts, thus pointing to growing income inequalities driven by educational achievements and by occupational class position. We do not see these similar patterns between education and class in the UK. Instead, much of the educational differences pass through the occupation, as the share of variance explained by education is remarkably low. Over cohorts, class passed from explaining around 10% to more than 15% of labour market income inequality, with a marked increase when elderly workers are considered. To be stressed, in the UK occupational class still plays the major role in explaining incomes (both market and disposable) variations. In Germany class is second to sex, but while sex is progressively reducing its impact across cohorts (especially on market income), class on the contrary increases in relevance, especially within young age-cohorts and independently from the kind of income considered. This trend of raising relevance of occupational class in explaining life-course income inequality, in both countries, is extremely relevant, as it completely disconfirms post-modern approaches to class, presented as a “zombie concept” destined to be locked away in the attic forever (Beck & Beck-Gernsheim, 2002).

Figure 8. Age-cohort specific decomposition of the variance of net labour and disposable income according to work instability, class, education, and sex.



6. Discussion and conclusions

This work attempted to evaluate the link between the de-standardization of work-lives and the strengthening of socioeconomic inequalities, across different institutional arrangements. In the last decades, work-lives became increasingly differentiated, unpredictable, and less secure across EU countries. This, however, is primarily depending on the institutional contexts: while in dualized and deregulated contexts growing working instability appears institutionally driven and concentrated among youngsters and young adults, as well as among women, less educated, and less skilled workers, elsewhere the literature reports that the new forms of less standard (but still secure) trajectories are becoming usual especially for higher societal strata.

Additionally, while part of the literature has tended to interpret these societal changes in term of postmodern individualization, other authors have underlined how the growth in work-lives de-standardization did not originate a vanishing of the classic mechanism of social stratification, among occupational class, followed by sex and education, are the most relevant.

While many works have analysed work-lives transformations, there is still scarce knowledge of the impact of work-lives instability on life-course income differences, in different institutional contexts. To fill such gap, we contribute by comparing post WWII birth cohorts over comparable moments of their life courses in Germany and the United Kingdom, which aim to resemble the contrast between a coordinated, corporatist and highly protected (but highly dualized) market economy and an open, liberal, and deregulated one. We performed this comparison by adopting an age-centred cross-sectional design confronting each age step across birth cohorts and leveraging previous longitudinal observations to elaborate a more comprehensive measure of accumulated work-life instability aimed at capturing employment, contractual, and occupational instability at once.

From our empirical analyses, distinct patterns over birth cohorts emerged in the two institutional contexts under scrutiny. First, in both contexts, work instability does play a significant impact on both market and disposable incomes. This already constitutes a relevant result, as it stresses how dependent labour paid a consistent part of the costs of the economic and labour market reforms implemented in Europe.

Concerning Germany, the documented changes are connected to its process of labour market deregulation at the margins and welfare shrinking. Across birth cohorts, the average exposure to work instability moved from lower levels with limited age variation to an increasingly marked age gradient to the detriment of young workers – the target of the deregulating reforms – and women.

A sizeable age gradient emerges also regarding the income disparities driven by work instability, with greater income differences in the early adulthood especially amongst working class workers. All in all, we can say that income security in the German labour market at all occupational levels remains attached to traditional stable and standard work trajectories, whereas experiencing de-standardised (early) careers entails earnings penalties. In discussing these results, though, one should not overlook the redistributive power of the welfare state: when considering income after social transfers we see that – in Germany - income penalties at the early age appear, in the end, to be buffered. On the contrary, some signals of penalization for unstable work-careers of aged workers in service class position, is found, likely consequent of cumulated income differences due to carousel careers.

In the United Kingdom, the picture is different. In a liberal and already flexible context, there have been no substantial changes in the exposure to work instability, whose impact remains similar across cohorts and age steps, but markedly more severe when women's careers are considered. Nevertheless, once we look at the income penalties associated with work instability, not cushioned by the welfare state intervention, we find that, among the working classes, work instability is increasingly associated with lower economic achievements over birth cohorts. This result stresses that economic and occupational transformations driven by global changes enlarge the already existing differences

between classes through the harsher consequences of work instability. Of course, in the winner/loser context of the UK, the relative economic loss for an unstable career may be stronger for higher class members - but while this penalty remains stable across age and cohorts, it worsens for working class members. Finally, we also highlight how the middle class – especially in liberal UK - appears increasingly less economically affected by a higher degree of work instability (and subsequent income penalty) even during the younger adulthood.

So, for what concerns the evolving link between destandardized work careers and economic disparities, we can affirm that major societal changes differently affected the relation between individual level employment and income security according to the country-specific institutional dynamics. While German younger cohorts more commonly experience initial instability and income disparities – however at the present buffered by the welfare - in the UK, market-based inequalities are not compensated by the state and, over cohorts, working classes appear to be increasingly disadvantaged because of an instable and insecure work-career. More in general, however, we can say that our results, based on a long-time span which allowed us to consider the proper birth cohorts, followed in their work-life for a convenient number of years and thus considering their ageing process, definitely dismantle the post-modernistic tales of both the vanishing relevance of class and the mid-high classes as the most exposed to vulnerability risks. It is not so, class (and sex and education) remains a powerful social stratifiers of post-industrial EU societies, differently affecting individuals' life courses according to the national institutional framework that shape each specific inequality trends.

Disposable data present, of course, important limitations concerning number of cases and observable life span. Nonetheless, we have shed light on the necessity to integrate a macro institutional perspective with an analysis of the micro-dynamics of social stratification to shed light on how changing work-lives across birth cohorts and age groups are enlarging socioeconomic disparities.

Such a limitation should guide future research, primarily increasing the number of included countries to exhaustively investigate the moderating influence of different institutions, and possibly making use of data enabling the researchers to upgrade the research design by exploiting the whole life trajectory up to each ageing step.

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Appendix

Appendix section A: tables and graphs

Appendix Table A1. Stepwise sample selection for each age-cohort combination - DE.

- To come

Appendix Table A2. Stepwise sample selection for each age-cohort combination - UK.

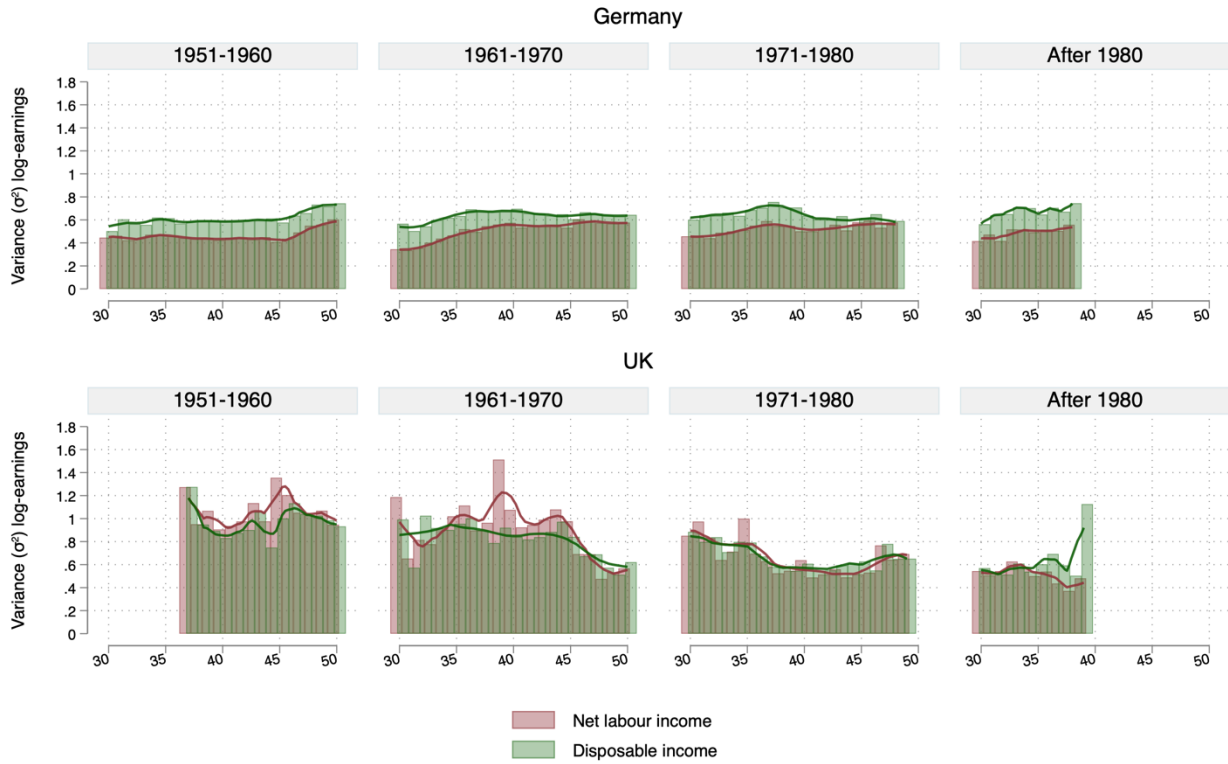
- To come

Appendix Table A3. Vocabulary of employment conditions.

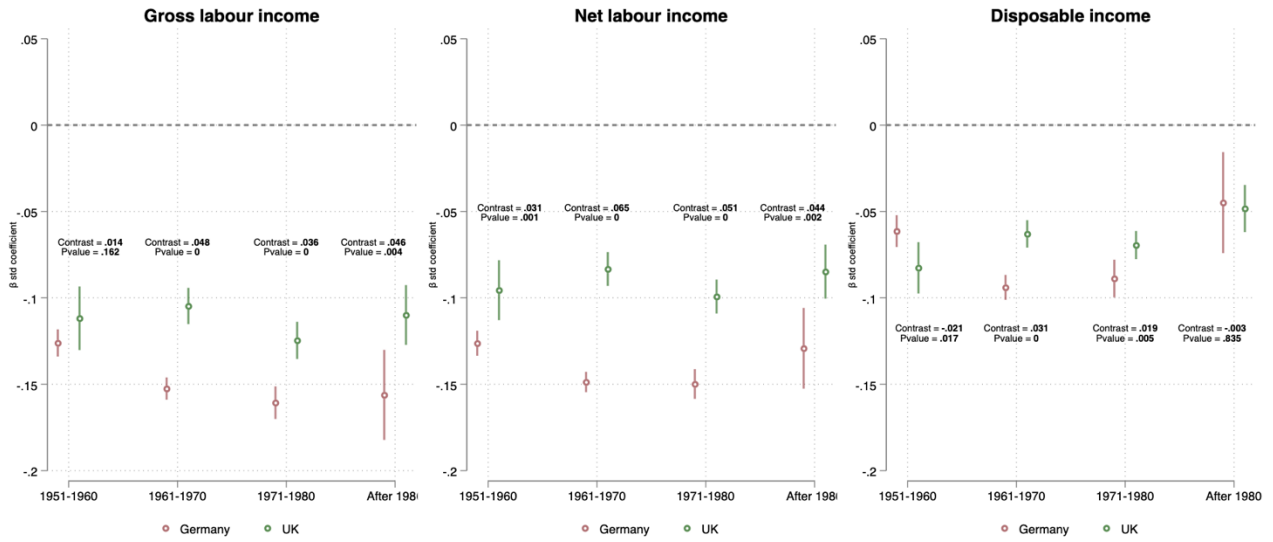
Employment states	Occupational level	Ordering (used just order, no numerical value)	Note
Full-time permanent contract	ISEI quintile 5	11	
	ISEI quintile 4	12	
	ISEI quintile 3	13	
	ISEI quintile 2	14	
	ISEI quintile 1	15	
Part-time permanent contract	ISEI quintile 5	21	
	ISEI quintile 4	22	
	ISEI quintile 3	23	
	ISEI quintile 2	24	
	ISEI quintile 1	25	
Full-time temporary contract	ISEI quintile 5	31	
	ISEI quintile 4	32	
	ISEI quintile 3	33	
	ISEI quintile 2	34	
	ISEI quintile 1	35	
Part-time temporary contract	ISEI quintile 5	41	
	ISEI quintile 4	42	
	ISEI quintile 3	43	
	ISEI quintile 2	44	
	ISEI quintile 1	45	
Self-employment	ISEI quintile 5	51	equivalence with 11
	ISEI quintile 4	52	equivalence with 12
	ISEI quintile 3	53	equivalence with 13
	ISEI quintile 2	54	equivalence with 14
	ISEI quintile 1	55	equivalence with 15
Education	/	60	Non comparable state (no positive/negative evaluation)
Parental leave	/	70	Non comparable state (no positive/negative evaluation)
Unemployment	/	80	
Inactivity	/	90	

Appendix Figure A1. Average levels of labour and disposable income variance over age and cohorts – DE & UK.

Age-cohort income variance (σ^2)



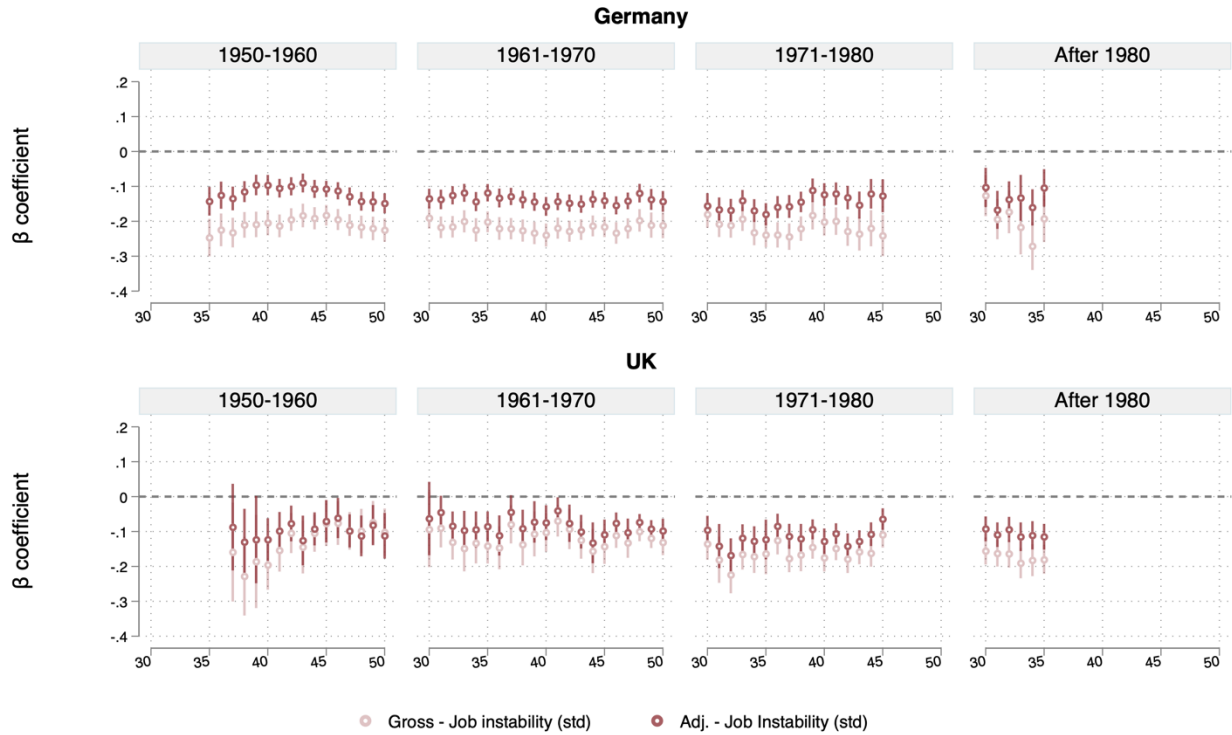
Appendix Figure A2. Comparison of cohort-aggregated coefficients between Germany and the UK – models account for age dummies.



Appendix section B: Regression models with and without adjustment for covariates

Appendix Figure B1. Comparison gross and adjusted age-cohort specific beta coefficient of accumulated work instability on log-transformed net labour income.

Beta coefficients gross & adjusted models on (log) adjusted net labour income



Appendix Figure B2. Comparison gross and adjusted age-cohort specific beta coefficient of accumulated work instability on log-transformed disposable income.

Beta coefficients gross & adjusted models on (log) adjusted net disposable income

