Main Article

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Multiple jobholding in the digital platform economy: signs of segmentation

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Summary

Although recent studies indicate that multiple jobholding is widespread in the digital platform economy, the interaction between people's engagement with digital platforms and the conventional labour market is rarely explored. This article brings new insights into this interaction, exploring the income of individuals combining paid work in the conventional labour market with income from distinct digital platforms. Based on two large-scale representative surveys of a random sample of 18,000 people in 2017 and 2019 in combination with administrative register data, we demonstrate how labour and capital platforms attract different income groups. We also find that online income in combination with non-platform income sources such as traditional jobs exacerbate the segmentation tendencies found in the conventional labour market. An increasing share of rich and poor seem to use different platforms, indicating a potential hierarchy of labour market segments in both the online and the conventional labour markets.

Résumé

Même si de récentes études indiquent que le cumul d'emplois est une pratique largement répandue dans l'économie des plateformes numériques, les interactions entre l'engagement des personnes sur les plateformes numériques et le marché du travail conventionnel sont peu étudiées. Cet article propose de nouveaux éclairages sur ces interactions, en étudiant les revenus des personnes qui combinent un travail rémunéré sur le marché du travail classique et des revenus provenant de différentes plateformes numériques. En se basant sur deux enquêtes représentatives à grande échelle, auprès d'un échantillon aléatoire de 18 000 personnes en 2017 et 2019, et sur les données

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des registres administratifs, l'article montre comment les plateformes de travail et de capital attirent des catégories différentes de revenus. En outre, il établit que les revenus en ligne combinés à des sources de revenus hors plateforme, comme les emplois traditionnels, accentuent les tendances à la segmentation constatées sur le marché du travail classique. De plus en plus, les riches et les pauvres semblent recourir à des plateformes différentes, ce qui suggère l'existence d'une hiérarchie potentielle des segments du marché du travail, sur le marché du travail en ligne comme sur le marché du travail classique.

Zusammenfassung

Aktuelle Studien deuten darauf hin, dass die Mehrfachbeschäftigung innerhalb der digitalen Plattform-Ökonomie weit verbreitet ist. In welcher Weise die Nutzung digitaler Plattformen und der konventionelle Arbeitsmarkt ineinandergreifen, wurde bisher jedoch kaum untersucht. Der vorliegende Artikel beschreibt neue Erkenntnisse über diese Interaktion und befasst sich mit der Frage, welches Einkommen Personen erwirtschaften, die Erwerbsarbeit im konventionellen Arbeitsmarkt durch Einnahmen ergänzen, die sie auf verschiedenen digitalen Plattformen erzielen. Auf der Grundlage zweier groß angelegter repräsentativer Befragungen einer Stichprobe von 18.000 Personen in den Jahren 2017 und 2019 in Kombination mit Daten aus Verwaltungsregistern zeigen wir, wie arbeits- und kapitalbasierte Plattformen jeweils unterschiedliche Einkommensgruppen ansprechen. Wir haben ebenfalls festgestellt, dass Online-Einkommen in Verbindung mit traditionellen Einkommensmodellen Segmentierungstrends verstärken, die im konventionellen Arbeitsmarkt zu beobachten sind. Eine wachsende Zahl sowohl wohlhabender als auch wenig gut situierter Personen scheint unterschiedliche Plattformen zu nutzen, wobei sich eine potenzielle Hierarchie von Arbeitsmarktsegmenten sowohl in den Online- als auch in den konventionellen Arbeitsmärkten abzeichnet.

Keywords

Platform economy, multiple jobholding, segmentation, income groups

Introduction

Who delivers your take-away, cleans your home, designs your website, rents their home or car to you and under what conditions? These are questions often raised by policy-makers, social partners and academic scholars when looking at the expansion of digital platforms such as Upwork and Airbnb designed to facilitate the purchase and sale of services across most Western economies (Schor et al., 2020). Recent studies have explored the size of the platform economy, the types and characteristics of digital platforms and their users, including the conditions under which they operate (Farrell and Greig, 2016; Wood et al., 2019). Their findings indicate that the platform economy remains limited in size, often operates outside much labour legislation and collective agreements, and changes the nature of the employment relationship through assigning a greater risk of precariousness to its workers (Berg et al., 2018; Farrell et al., 2019). However, these findings often differ depending on the definitions and selection criteria used to determine a) which types of websites and apps fall inside or outside distinct categories of digital platforms, and b) the type of services, including paid or unpaid work (Howcroft and Bergvall-Kåreborn, 2019). Much of this literature tends to analyse the platform economy in isolation, rarely exploring the interlinkages between an individual's engagement with distinct platforms and the conventional labour market,

even if multiple jobholding is widespread in the platform economy (Pesole et al., 2018; Vallas and Schor, 2020).

Based on two large-scale, representative and cross-sectional surveys covering 18,000 randomly selected people conducted in 2017 and 2019 as part of the Danish Labour Force Survey (LFS), as well as on administrative register data, this article offers novel insights into the interaction between paid platform activities and the conventional labour market. Our analysis focuses on people combining paid work in the conventional labour market with income from distinct digital platforms.

Our key research questions are 1) Do distinct types of digital platforms attract different groups such as the lower-skilled, the young, women, migrants?; and 2) How does income from digital platforms in combination with non-platform income sources such as other jobs or income support affect exposure to income insecurity? To address these research questions, we distinguish between two broad categories of digital platforms: *Labour platforms* such as Uber and Upwork, defined as digital intermediaries allowing the purchase and sale of typically labour-intensive services; and *Capital platforms* like Airbnb and GoMore[1] for renting private assets. This distinction allows us to compare the characteristics of individuals active on distinct types of digital platforms, including their different income arrangements. The analysis thus contributes to a research area, where few studies have explicitly examined the combined effects of online income and non-platform income sources on an individual's risk of income insecurity. We specifically explore how such a combination leads to different labour market segmentation tendencies.

Analytically, we draw on multiple jobholding and segmentation literature, seeking to combine it with the growing body of research on the platform economy with a view to gaining a better understanding of the interaction between distinct digital platforms and the conventional labour market. We define multiple jobholding in accordance with Campion et al. (2020) as *"the act of working more than one job simultaneously, including working for employers and self-employment, wherein all tasks or sets of tasks are performed in exchange for or expectation of compensation"*. We consider income from both labour and capital platforms in combination with income from other jobs in the conventional labour market as multiple jobholding, although capital platforms are by definition not part of the labour market (at least in Denmark), since income earned on them is classified as capital income (Ilsøe and Larsen, 2020). While individuals active on capital platforms are classified neither as workers nor self-employed, their online activities involve a certain amount of work to get the private assets ready to be rented and thus fall under Campion et al.'s (2020) definition of multiple jobholding, as such work can be considered paid work (Schor et al., 2020). In line with other research, we expect that the two types of platforms will attract different groups with distinct characteristics (Berg et al., 2018). We further posit that the combined effects of income from digital platforms and non-platform sources may spur different tendencies of labour market segmentation. In some instances, platform activities are associated with inherent risks of increased labour market segmentation due to the weak regulatory framework surrounding large parts of the platform economy. This may especially be the case when an individual's main source of income provides only limited protection against the precariousness typically associated with platform work (Thelen et al., 2018). In other instances, the online income may serve as a path towards upward labour mobility through allowing workers to exit their segmentation status in the conventional labour market (Schor et al., 2020).

1 GoMore is a large Danish-owned platform facilitating car rental, sharing and leasing in Denmark, Sweden, Norway and Spain.

The article is structured as follows. We start by discussing distinct forms of digital platforms, before going on to develop an analytical framework based on a review of the literature on multiple jobholding and labour market segmentation. We then present the methods and datasets used, followed by our analysis. We conclude by discussing our findings.

Introducing digital labour and capital platforms

A growing body of literature has examined the platform economy. These studies apply a plethora of classifications to capture the various activities involved in it, with results tending to differ depending on the definitions used, the national context, and their theoretical, methodological and empirical approach (Howcroft and Bregvall-Kåreborn, 2019: 25). Thus, the concept of digital platforms is highly contested within the literature. One of the broadest definitions is used by Fuchs and Sevignani (2013), who include paid and unpaid virtual work as well as a platform's users, service providers and founders. Others operate with much narrower definitions (Schor, 2016).

In this article, we adopt a rather narrow definition of digital platforms, as our focus is on the service providers, i.e., those who earn income via their intermediary, disregarding their customers and founders. Our aim is to study how digital platforms contribute to service providers' income levels and thus potentially to labour market segmentation. Furthermore, we distinguish between two main types of digital platforms, knowing well that other studies operate with different classifications. These are: 1) *capital platforms* such as Airbnb that allow providers to rent their private assets; and 2) *labour platforms* such as Uber that facilitate the purchase and sale of typically labour-intensive services (Schor and Attwood-Charles, 2017). This distinction is widely used in the literature, but rarely applied when exploring the interaction between distinct platforms and an individual's non-platform income sources (Howcroft and Bergvall-Kåreborn, 2019: 25).

The more specific labour platforms included are those facilitating work in the form of gigs (small tasks in the physical world) such as courier services, cleaning tasks, etc. or as crowdwork (tasks done via a computer) like UpWork, Worksome (De Stefano, 2016; Schmidt, 2017). There are major differences between individual types of labour platforms. Working conditions and pay levels typically vary, with greater earnings potential on platforms facilitating highly specialised services (Schor et al., 2020). Likewise, some labour platforms offer higher levels of social protection, including minimum wage guarantees, by shouldering the employer responsibility of employee protection (Berg et al., 2018; Drahokoupil and Piasna, 2019). Against this background, we group distinct types of labour platforms together as one broad group since they all concern the provision of labour in exchange for financial compensation, in fundamental contrast to capital platforms, where financial gains arise from renting private assets via the platform, without much labour involved. This distinction allows us to explore the characteristics of multiple jobholders active on labour platforms vis-à-vis those on capital platforms, and implicitly to see what impact their multiple income has on income insecurity.

Regarding capital platforms, we adopt a relatively narrow definition. We omit websites facilitating the buying and selling of used goods since we want to show how digital platforms contribute to securing a steady income, unlike the one-off income generated by occasionally selling used belongings. A number of studies look at different types of capital platforms, ranging from advertising platforms such as Google and Facebook to cloud, industrial, product, crowdfunding and lean platforms (Srnicek, 2016). In this article, we look exclusively at capital platforms such as Airbnb, used to rent out private assets. Omitting capital platforms for business-to-business or business-to-consumer services, we focus on the interaction between people's income gained by means of digital platforms and their other non-platform income sources. This definition of capital platforms

may have implications for our results, possibly making them more conservative than other studies such as those of Huws et al. (2017) or Farrell et al. (2019), which work with broader definitions.

Multiple jobholding, segmentation and the platform economy – literature review and concepts

Platform work has been subject to increased research, with different strands of literature exploring the size of the platform economy, types of platforms, risks of precariousness, algorithmic control, along with the potential efficiency gains, cost reductions and the regulatory setting (Farrell and Greig, 2016; Schor et al., 2020; Thelen et al., 2018). Less researched is the interrelationship between the platform economy and the conventional labour market, as much research concentrates on the platform economy itself without considering the wider labour market (Vallas and Schor, 2020). The few studies exploring this interrelationship point to important links between people's engagement in online activities and their position on the conventional labour market, including their exposure to precariousness (Healy et al., 2017; Schor et al., 2020). These studies suggest that while platform work is the sole source of income for some, others combine multiple sources of income, with their platform work rarely being their main source of income (Pesole et al., 2018). However, these studies rarely focus on an individual's combined income from platform and non-platform work, or how this impacts labour market segmentation (Kahancová et al., 2020; Schor et al., 2020). To overcome these shortcomings, we draw on insights from literature on multiple jobholding and labour market segmentation to provide us with concepts capturing the potential mechanisms fostering multiple jobholding in the platform economy and labour market segmentation.

Employing the notion of primary and secondary jobs, the *literature on multiple jobholding* explores among others the motives behind people's decisions to take up a second or even third job and the implications of multiple jobholding for their employment biographies and situations (Conen, 2020). The underlying motives have been subject to much research and are often grouped into one of two broad categories 'financial necessities' and 'boosting preferred job portfolios'. However, the effects of multiple jobholding are less well documented (Campion et al., 2020). While the multiple jobholding literature includes a myriad of motives for opting for multiple jobs, we focus on the role of income for people generating income via platforms. Research suggests that platform work and multiple jobholding are often associated with increased risks of precariousness and financial difficulties (Campion et al., 2020; Kalleberg and Vallas, 2018). The multiple jobholding literature on 'financial necessity' points to low and/or inconsistent earnings in their primary jobs being an important driver for people to take on further jobs, even at a lower wage (Hirsch et al., 2016: 1; Pouliakas, 2018). Studies explicitly exploring multiple jobholding within the platform economy point to close ties between people's engagement in paid platform work and the conventional labour market, with those active on capital platforms displaying greater financial security than those exclusively dependent on income notably from low-paid platform work (Schor et al., 2020). Following this vein of literature, we expect that people's income levels may have an impact on their engagement in distinct platform activities. We also expect multiple jobholding to influence people's exposure to income insecurity, with digital platforms often depending on the protection offered by conventional jobs, as argued by some commentators (Schor et al., 2020; Thelen et al., 2018). By building on these notions, we seek to capture the role of multiple jobholding in fostering segmentation tendencies at the nexus between the online and conventional labour market.

The segmentation literature offers insights into the mechanisms fostering labour market segmentation. It assumes that the labour market is divided into at least two segments: the core segment in which jobs are stable, typically full-time, with social benefits and well-paid; and the peripheral segment where employment is insecure, with few social benefits and less well renumerated (Doeringer and Piore, 1971; Grimshaw et al., 2017). Digital platforms are often considered as a further segment or layer, with platform work tending to be seen as an emerging form of insecure work (Kalleberg and Vallas, 2018; Thelen, 2019). According to this literature, digital platforms often reject the traditional employer responsibilities of shouldering employee protection, exert downward pressures on wages, tend to be unregulated and entail high employment insecurity, fragmented and unpredictable working hours and poor job quality (Berg 2016; Thelen, 2019). Multiple mechanisms underlie labour market segmentation, including the role of the regulatory setting (labour laws and collective bargaining) and individual worker characteristics such as gender, age, skills, financial situation, other jobs, etc. (Rubery and Piasna, 2017). Much segmentation literature stresses that individual worker characteristics may influence segmentation, although labour laws and collective bargaining are considered instrumental in limiting inequality by restraining employers' ability to gain flexibility and cut costs through dividing the workforce (Grimshaw et al., 2017; Rubery and Piasna, 2017). Others point to the dual nature of labour market institutions, arguing that the very same regulatory framework produces differing working conditions for distinct worker categories, reinforcing such labour divides. Individuals often join distinct segments based on their bargaining power stemming from their skill levels, earnings, age, gender, etc. (Palier and Thelen, 2010; Rubery and Piasna, 2017). Following this literature, the platform economy with its weaker regulatory framework, lower entry barriers and fewer social benefits compared to the more strictly regulated conventional labour market with its higher levels of social protection, is assumed to attract distinct groups and produce different segmentation tendencies, with sharp demarcations between the segments (Rubery, 2015; Thelen et al., 2018).

Contributing to this discussion, we propose a perspective moving beyond the usual approach that assumes limited mobility between segments when dealing with labour market divides. Multiple jobholding as a concept may offer a way to capture the potential interlinkages, finding possible bridges between distinct segments, i.e., between the platform economy and the conventional labour market. Individuals combining work in these two worlds are active in distinct segments. While only certain groups are able to offer distinct online capital platform services typically related to private ownership, labour platforms are assumed to be governed by such factors as skills and educational attainment. Both types of digital platforms are expected to be associated with insecure work, but at different levels. The effects of a weak regulatory framework for the platform economy combined with people's non-platform income sources may compensate for the lower levels of protection dominating digital platforms. We thus add another layer to the growing literature on digital platforms and segmentation by exploring how multiple jobholding in the platform economy contributes to shaping labour market inequality. Such analyses on the interaction between distinct labour market segments are gaining pivotal importance through the recent expansion of the platform economy and other emerging forms of insecure work that often entail lower levels of protection. Research analysing the linkages between the platform economy and the wider labour market points to an increasing awareness of the platform economy's dependence on the income security offered by the conventional labour market, possibly fostering different segmentation tendencies (Schor et al., 2020; Thelen et al., 2018).

To advance our understanding of these dynamics, we present an analytical framework depicting distinct situations governing the interplay between income from the platform economy and the conventional labour market. We identify four ideal-types of segmentation tendencies, omitting

Table 1. Multiple income across segments: signs of segmentation.

		Income from the conventional labour market	
Income from digital platforms		*High income level*	*Low income level*
	High income level	Signs of **reinforcing** segmentation (a)	Signs of **reducing** segmentation (b)
	Low income level	Signs of **maintaining** segmentation (c)	Signs of **increasing** segmentation (d)

Authors' own construction inspired by Barton et al. (2021).

middle-income groups to reduce complexity, although their situation may also impact labour market segmentation in similar ways (Table 1).

We posit that there are four segmentation tendencies, each one reinforcing, maintaining, reducing or increasing labour market divides, reflecting different dynamics and distinct starting points. The role of platform income in shaping labour market segmentation may vary from one situation to another. The two starting points are high income (defined as the upper income quartile) or low income (defined as the lower income quartile) levels from the conventional labour market.

The first situation (a) depicted in the table has as its starting point high income from the conventional labour market, combined with high platform income. This situation *reinforces* segmentation tendencies, as it may lead to increased diversification of income and income inequality in the wider society, possibly reinforcing people's positions in the labour market.

A second situation (b) is that high platform income may compensate for low income in the conventional labour market, thereby providing a path for upward labour mobility by allowing workers to exit their segmentation status in the conventional labour market (Healy et al., 2017). This situation can potentially not only *reduce* segmentation, but also bridge segments instead of reinforcing demarcations between core and peripheral labour markets.

The third situation (c) is when high income in the conventional labour market shields the risk of low income from platform activities. Recent studies on multiple jobholding in the platform economy point to greater financial security among individuals combining online work with highly-paid conventional jobs (Schor et al., 2020). Low online income thus contributes to *maintaining* segmentation tendencies seen in the conventional labour market.

The last situation (d) occurs when low income from the conventional labour market is combined with low platform income. This may lead to a situation of *increased* segmentation, where the combined effects of low income from the conventional labour market and low income from unregulated platform work with low protection may amplify the risk of precariousness (Berg et al., 2018; Collier et al., 2017).

This analytical framework will be used to explore the interaction between people's paid online activities and their non-platform income sources based on the methodology and dataset presented below.

Methodology and dataset

To map the extent of income from digital platforms, we introduced three questions on digital platforms into the Danish Labour Force Survey (LFS) conducted in the first quarter (Q1) of 2019, the repetition of a survey carried out two years earlier (Ilsøe and Larsen, 2020). We chose the LFS,

Table 2. Questions on digital platforms added to the Danish Labour Force Survey, 1st quarter 2017 and 2019.

Question 1) During the past 12 months, have you generated income by performing work tasks found via websites or apps – for example via Uber/Happy Helper?*	Yes No
Instructions: Uber provides driving services online, where car owners can make money by transporting passengers from A to B. Additionally, it could be work tasks found through Happy Helper, Upwork, Meploy or A handyhand. This also applies to gigs found through other websites and apps. The question does NOT include selling of used belongings or other second-hand goods – for instance via bilbasen.dk or dba.dk.	
Question 2) During the past 12 months, have you generated an income by renting out your property or possessions via websites or apps – for example via Airbnb?	Yes No
Instructions: Airbnb is an online housing agency service, where private people can rent out their home or parts thereof. Other examples could be renting out your car via GoMore or your tools via Jepti	
Question 3) How much money have you generated via websites or apps over the past 12 months – before tax? (only if yes to question 1 or 2) Instructions: If IP is in doubt, he/she is allowed to estimate.	Less than 25,000 DKK 25,000–49,999 DKK 50,000–74,999 DKK 75,000–99,999 DKK 100,000–199,999 DKK 200,000–299,999 DKK 300,000 DKK or more Don't know

* In 2019, Uber was not mentioned as an example, as Uber was no longer active in Denmark.

because the quality and the size of the survey allowed us to measure the extent of a growing, but still limited phenomenon on the Danish labour market and to analyse the characteristics of people gaining income from digital platforms (employment status, demographics, etc.). The Q1 2019 LFS received responses from 18,583 Danes, corresponding to a response rate of 56 per cent, while the Q1 2017 survey covered 18,043 Danes, corresponding to a response rate of 52 per cent. To comply with Statistics Denmark's practice and guidance on reporting quarterly data, results are presented as weighted data to ensure representativeness (Statistics Denmark, 2012). Numbers representing fewer than 7000 people are reported as uncertain in the analysis, while those representing fewer than 4000 are not displayed.

In both 2017 and 2019, we asked respondents the additional questions listed in Table 2, with these questions forming the *dependent variables* i.e., income from online labour and capital platforms, respectively. Due to the low numbers of observations, especially in the income brackets above 25,000 DKK (€3333) per year before tax (hardly any respondents reported online income above 50,000 DKK per year), we had to merge the higher income brackets, leaving us just two income brackets for income from digital platforms: below €3333 and above €3333 per year.

We included the control variables listed in Table 3 in our regression analyses, as much segmentation literature considers these to play a key role in precariousness risks. However, we were unable to control for employment forms such as part-time, fixed-term or open-ended contracts due to low numbers of observations in these categories.

Table 3. Description of variables used in regression analyses.

Dependent variable:	
Income from digital platforms	Capital Labour
Control variables:	
Total annual income other than income from online platform work	Categorised as income quartiles
Age	Continuous variable
Level of education	LFS categories (Primary, Upper secondary and vocational training, BA, MA & PhD)
Gender	Male and Female
Ethnicity	Recoded to Danish vs. foreign-born
Employment status	Recoded to Employed or other (unemployed, etc.)

Data on total income derived from non-platform income sources such as other jobs, income support, etc. was obtained via Statistics Denmark from national administrative register data. We cannot expect income from digital platforms to be included in this national register data. Screenings conducted by the Danish tax authorities reveal that 95–99 per cent of individuals earning income from platforms do not report it (Fink and Ettrup, 2019). The demographic variables and employment status were included in the standard LFS questionnaire.

Our analytical strategy was twofold: we first wanted to analyse the activity on and income from labour and capital platforms in 2017 and 2019 respectively, using descriptive statistics. Second, we wanted to map the probability of accruing income from the two types of platforms in 2017 and 2019 using linear regression analysis. This analysis includes a comparison of platform service providers' demographics, employment status and their total non-platform income in 2017 and 2019. We use linear regression instead of logistic regression analysis, although the dependent variable is binary, due to omitted variable biases. In addition, odds ratios as effect measures reflect the degree of unobserved heterogeneity in the model. Hence, we cannot compare the effects found in a logistic regression analysis over time, as the effects are limited to interpretations within the model, not to other effect estimates (Mood, 2010). We report the coefficients for the indicator variables' effects as well as the significance level and the robust standard errors[2] in order to test the robustness of our analyses. Through using robust standard errors in estimating the model, we were able to deal with problems of heteroscedasticity in the data, as this knowingly limits the chance of effects being significant (Gujarati and Poter, 2010: 274–311; please see the Appendix for further information on the data and methods used).

Findings

The platform economy in Denmark

The first digital platforms arrived in Denmark in the 2000s when GoMore, the Danish-owned capital platform for car-sharing and car-renting, was launched, soon to be followed by the US-

2 The standard error indicates that at a confidence level of 0.05, 95 per cent of the observations falls within +/- SE per cent of the predicted regression line, i.e., SE=0.5 means that +/-0.5 per cent of the observations falls outside the predicted value – thus indicating a good fit on the population.

Table 4. Key features of digital platforms and their service providers in Denmark (%).

	Labour platforms		Capital platforms	
	2017	2019	2017	2019
Share of the active Danish workforce providing paid services via a digital platform within the last 12 months	1.0	1.0	1.5	1.3
Amount of income gained from digital platforms before tax:				
Less than €3333 per year	70	74	71	60
€3333 or more per year	13*	12*	19	27
Share of MJHs among digital platform providers	49	64	72	76
Income groups active on digital platforms:				
Lowest income quartile	43	41	14	16
Next to lowest income quartile	25	19	25	18
Next to highest income quartile	16	20*	20	22
Highest income quartile	16	19*	40	44

* Unreliable estimate due to small n (n<7000).
Source: Authors' own calculations based on weighted data.

owned rental service Airbnb. Labour platforms arrived a few years later, with Uber launching its Uber Pop service in Denmark in 2014 (it ceased operations in April 2017). Since then, the number of Danish-owned labour platforms has mushroomed, especially within the fields of cleaning, transportation and hospitality.

Limited in size, the Danish platform economy has hardly expanded since 2017. Just 2.3 per cent of the Danish population sold their labour or rented out private assets via a digital platform in 2019 compared to 2.4 per cent in 2017. Around 1 per cent derived online income from a labour platform, while 1.3 per cent rented out their private assets through a capital platform in 2019 (Table 4). Only a small fragment of those active on digital platforms in 2019 used both labour and capital platforms (around 0.1 per cent), echoing the 2017 results (Ilsøe and Larsen, 2020). The amount of income generated via labour and capital platforms remains fairly low, at least in a Danish context: it is generally either less than €3333 per year or between €3333 and €6713, with hardly anyone earning more. This is much lower than for example Danish unemployment benefits which total €30,744 per year for full-time workers (€20,580 for part-time) or Danish student allowances: €9936 per year for students not living at home.

There seem to be marked differences between income generated on labour platforms and that on capital platforms, with the income gap appearing to have widened in the last few years. In 2019, 27 per cent of those active on a capital platform generated incomes of €3333 or more from their online activities compared to 19 per cent in 2017. No similar development was seen on labour platforms, where the figures have remained fairly stable (Table 4). Furthermore, capital and labour platform service providers seem to differ as to their total annual income from other non-platform sources: 41 per cent of labour platform service providers belonged to the lowest income quartile in 2019, while 44 per cent of capital platform service providers belonged to the highest quartile (Table 4). Such findings point to segmentation, with labour and capital platforms seemingly attracting distinct income groups.

This is further underpinned when looking at service providers' characteristics such as whether they are multiple jobholders (MJHs). An increasing share of providers on both labour and capital platforms combine their online income with income from conventional employment. 76 per cent

Table 5. Linear probability regression model, probability of income on labour platforms.

Labour platforms	2017 base model b (SE)	2017 full model b (SE)	2019 base model b (SE)	2019 full model b (SE)
1st income quartile (ref.)	0 (.)	0 (.)	0 (.)	0 (.)
2nd income quartile	-0.285 (0.076)***	-0.208 (0.08)**	-0.257 (0.078)**	-0.064 (0.077)
3rd income quartile	-0.335 (0.076)***	-0.2 (0.088)*	-0.288 (0.073)***	-0.044 (0.089)
4th income quartile	-0.471 (0.064)***	-0.281 (0.092)**	-0.448 (0.062)***	-0.116 (0.088)
Primary education (ref.)		0 (.)		0 (.)
Upper sec. + voc. training		0.081 (0.069)		-0.16 (0.067)*
BA		-0.063 (0.081)		-0.251 (0.077)**
Master & PhD		-0.082 (0.091)		-0.419 (0.081)***
Age		-0.006 (0.002)**		-0.01 (0.002)***
Male (ref.)		0 (.)		0 (.)
Female		-0.087 (0.05)		-0.089 (0.047)
Danish (ref.)		0 (.)		0 (.)
Foreign-born		0.104 (0.089)		0.112 (0.084)
Employed (ref.)		0 (.)		()
Not Employed		0.083 (0.064)		0 (0.062)
Constant	0.682 (0.052)***	0.810 (0.097)***	0.687 (0.047)***	1.111 (0.081)***
Adjusted R^2	0.13	0.19	0.12	0.26
Observations, N (weighted data)	**97,787**	**97,787**	**94,742**	**94,742**

Robust standard errors in parentheses. * p<0.05, ** p<0.01, *** p<0.001.
Source: Authors' own calculations based on weighted data.

of those active on capital platforms were MJHs in 2019, compared to 72 per cent in 2017 (Table 4). Though less widespread on labour platforms, multiple jobholding seems to be increasing rapidly; in 2019, 64 per cent of those active on a labour platform combined their online income with a conventional job compared to 49 per cent in 2017. Online income thus seems to be a supplement rather than the main source of income for many service providers. Many hold multiple jobs and many generate less than €3333 per year from platform work. For those not active in the conventional labour market, further analyses of our data suggest that nearly one in three on labour platforms are students topping up their student allowances with paid platform activities. A smaller group on capital platforms are retirees supplementing their pensions, whereas a small group on labour platforms are unemployed workers supplementing their unemployment benefits. The groups generating income via the two types of platforms would thus seem to differ – aspects we explore below.

Labour platforms and multiple jobholding

Our regression analyses of people's probability of generating income via labour platforms in 2017 echo the descriptive statistics. Total income from non-platform sources seems to affect this probability. Those from the lowest income quartile are more likely to offer and sell their services via a labour platform than those in the highest income quartile (Table 5). However, several demographic variables also seem to explain this behaviour, at least partially, with age in particular affecting this probability in both 2017 and 2019, as did education in 2019, i.e., the young and lower-skilled were more likely to be active on a labour platform (Table 5). In fact, people

become less likely to work via labour platforms, the older they are and the higher their level of education (Table 5).

The higher activity level on labour platforms among low-income groups indicates that combining online income with a conventional job could reflect financial necessity. The fact that many workers are young and often low-skilled (at least in 2019) suggests that the digital labour market mimics to some extent the segmentation tendencies seen in the conventional labour market, where the poorest, lower-skilled and the young are often overrepresented in traditional forms of non-standard employment (Rubery, 2015). Unlike their older, often more highly educated and typically financially better-off peers, low-income platform workers face an increased risk of precarious employment when active on a labour platform, as they often lack the financial security of a well-paid conventional job. Our results are thus in line with our expectation that gigs via labour platforms may be just another form of non-standard employment with an increased risk of precariousness. Labour platforms not only resemble less-regulated settings with low levels of social protection, but also seem, in line with our expectations, to primarily attract some of the most vulnerable labour market groups, potentially more susceptible to exploitation.

At the same time, our regression results also point to a changing situation between 2017 and 2019. In 2019, we find that a larger share of people active on digital labour platforms belong to income groups other than the lowest (Table 5). However, the income effects diminish when controlling for demographic factors such as age and education. Our descriptive statistics similarly indicate that multiple jobholding, where people increasingly combine a conventional low- or average-paid job with a low online income, has become more common on labour platforms in the last few years. Combined with the fact that earnings from labour platforms continue to be fairly low (less than €3333), this development suggests that income from conventional jobs may cushion the risks of a low online income, seemingly a characteristic of most platform work in Denmark. Unlike our expectations, our results thus imply that platform work in combination with non-platform income may contribute to *maintaining* the segmentation tendencies seen in the conventional labour market. Labour platforms are increasingly attracting new groups, notably people with greater financial security and thus able to fend off risks of income insecurity on the online market. As platform workers with protection from their conventional jobs rather than from their online income, they would seem to contribute to maintaining labour market segmentation.

Our results also indicate that some of the most vulnerable groups continue to be overrepresented on labour platforms. They often have less financial security from that offered by conventional jobs, student allowances or unemployment benefits. The combined effects of these distinct groups' different situations point to labour platforms not only maintaining, but also contributing to increase labour market segmentation. Their lower levels of non-platform income provide just limited protection against the financial insecurity of a low income from an often less-regulated labour platform. This may in some instances amplify the risk of precariousness, thus contributing to *increased labour market segmentation* when non-platform income is limited or even non-existent. Research suggests that workers with little social protection are also more likely to accept poor working conditions (Rubery, 2015; Wood et al., 2019).

Capital platforms and multiple jobholding

Capital platforms appear to attract different income groups, with our regression analyses echoing the descriptive statistics. People's total income from non-platform sources seems to affect their probability to provide services via a capital platform, but in a different way than seen on the labour platforms. High-income groups are more likely to rent out their private assets via a capital

Table 6. Linear probability regression model, probability of income from capital platforms.

Capital platforms	2017 base model b (SE)	2017 full model b (SE)	2019 base model b (SE)	2019 full model b (SE)
1st income quartile (ref.)	0 (.)	0 (.)	0 (.)	0 (.)
2nd income quartile	0.278 (0.076)***	0.203 (-0.08)*	0.211 (0.079)**	0.030 (0.080)
3rd income quartile	0.349 (0.075)***	0.220 (0.086)*	0.245 (0.074)**	0.013 (0.087)
4th income quartile	0.479 (0.062)***	0.302 (0.089)***	0.417 (0.062)***	0.090 (0.086)
Primary education (ref.)		0 (.)		0 (.)
Upper sec. + voc. training		-0.054 (0.069)		0.137 (0.07)
BA		0.116 (0.076)		0.204 (0.08)*
Master & PhD		0.102 (0.085)		0.422 (0.079)***
Age (year)		0.005 (0.002)**		0.010 (0.002)***
Male (ref.)		0 (.)		0 (.)
Female		0.074 (0.048)		0.066 (0.048)
Danish (ref.)		0 (.)		0 (.)
Foreign-born		-0.092 (0.085)		-0.096 (0.091)
Employed (ref.)		0 (.)		0 (.)
Not Employed		-0.067 (0.063)		0.012 (0.064)
Cons.	0.356 (0.053)***	0.222 (0.094)*	0.380 (0.050)***	-0.022 (0.088)
Adjusted R^2	0.14	0.20	0.11	0.24
Observations, N (weighted data)	**97,787**	**97,787**	**94,742**	**94,742**

Robust standard errors in parentheses. * p<0.05, ** p<0.01, *** p<0.001.
Source: Authors' own calculations based on weighted data.

platform, whereas the lowest income groups are the least active on capital platforms. However, when controlling for several demographic factors, the effects of income on the probability of renting out private assets via a capital platform diminish, as seen in 2019. Age and education rather than earnings from other sources seem to impact people's engagement with capital platforms, though the effects are different to those on labour platforms. Unlike the latter, people are *more* likely to gain an income from a capital platform the older and more educated they are (Table 6).

Older and well-educated groups tend to have higher levels of financial security, making them more likely to combine income from a capital platform with income from a conventional job. Such findings echo other recent platform studies, indicating – in line with our expectations – that capital platforms attract some of the core groups of workers listed in much segmentation literature (Grimshaw et al., 2017; Schor et al., 2020). The fact that high-income groups often have rentable assets, not least in the form of property, opens the door for them to make use of capital platforms to diversify their income sources, in turn strengthening their core position in wider society. The financial security of high-income groups also gives them a significant buffer to mitigate any potential risks associated with generating income in a less-regulated setting such as capital platforms. Furthermore, capital platform service providers often earn more via the platform than their labour platform peers, boosting their financial buffer. Therefore, capital platforms seem not only to mimic, but even to *reinforce existing segmentation tendencies*, where those already belonging to the better-off strengthen their core position in the online market as well.

When comparing the situations in 2019 and 2017, our regression results indicate that the effect of total income is less decisive in 2019 when controlling for different demographic factors. Age and education seem in particular to explain variations in the probability of renting out private property via a capital platform. These findings suggest that an increasingly diverse group are active on capital platforms. Combined with the fact that earnings from capital platforms have increased over the last few years, this indicates that the income potential from capital platforms is growing and appealing to new groups. Therefore, capital platforms may not only contribute to reinforcing the segmentation tendencies seen in the conventional labour market by strengthening the position of those with high incomes and high levels of education. They may also *reduce* the segmentation tendencies seen in the conventional labour market. Capital platforms may supply lower-income groups with a financial buffer able to mitigate the income insecurity associated with their income from other viable means such as conventional jobs. Income from capital platforms is often higher than that from labour platforms and seems to have increased faster in the last few years. Such income thus has the potential to strengthen these groups' financial buffer.

These findings point to the important interaction between the online and conventional labour market, where multiple jobholding has the potential to bridge segments, i.e., the platform-based and conventional labour markets, leading to upward income mobility and thus implicitly reducing labour market segmentation.

Discussion and conclusion

Based on two large-scale, representative, cross-sectional surveys in Denmark, this article offers new insights into the interlinkages between the income activities of people combining paid work in the conventional labour market with income from capital and labour platforms and the underlying interaction between the online and conventional labour markets in shaping income inequality and labour market segmentation. In our analysis, we draw on multiple jobholding and segmentation literature, seeking to link it to the growing body of research on digital platforms. Two main aspects are emphasised in the discussion of our findings.

Platform service providers are often in practice MJHs: Our analysis demonstrates that both labour and capital platforms continue to play only a small role in the Danish economy, with income from platforms remaining fairly low (less than €3330 per year before taxes). Most platform service providers combine their paid platform activities with non-platform income sources such as conventional jobs, income support, etc. Many have multiple jobs, with 64 per cent of those active on labour platforms combining their online work with jobs in the conventional labour market. Our results further indicate that the two types of platforms attract very different groups, with hardly any active on both types of platforms. High-income groups are overrepresented on capital platforms together with older and often well-educated people, whereas low-income groups, the young and the lower-skilled are overrepresented on labour platforms. In many ways, these divisions mimic the profiles of insiders and outsiders, a phenomenon well-described in the segmentation literature (Atkinson, 1987; Rubery et al., 2018). Those on lower incomes tend to supplement their income from the conventional labour market with income from labour platforms, while those on higher incomes are more likely to top up their income from conventional jobs by diversifying their income sources to include renting out assets via capital platforms. Our findings thus point to a potential hierarchy of segments in the online market that seemingly mimics the labour market divide seen in the conventional labour market. This calls for further research into the distinct platforms operating in the online economy. Our quantitative findings of a potential hierarchy of online segments corroborate with recent

qualitative platform studies which point to wages and working conditions typically differing across distinct labour platforms, with higher earnings potentially achievable on specialised platforms (Berg et al., 2018; Schor et al., 2020).

The platform economy contributes to different segmentation tendencies: labour versus capital platforms: Our analysis points to important interlinkages between the online and conventional labour markets, with people combining online income with income from conventional employment or other income sources, such as student allowances, pensions or unemployment benefits. Capital and labour platforms often operate in a market less well-regulated than the conventional labour market, with the financial buffer offered by people's non-platform income seemingly pivotal in compensating for the lack of protection in the digital platform economy. Our results suggest that people active on capital platforms often belong to the upper income quartile and are older workers with a higher level of educational attainment, while their peers on labour platforms tend to be young people – typically students, lower-skilled and unemployed – who combine online income with either a conventional low-paid job, a student allowance or unemployment benefit. This provides platform workers with very different financial buffers to mitigate the risks often associated with platform work, leading some commentators to speak of a parasitic relationship between the digital economy and the wider labour market (Schor et al., 2020).

Our results indicate that the digital platform economy may contribute to labour market segmentation, but in four different ways. In most cases, and unlike our expectations, digital platforms in combination with non-platform income sources seem to *maintain the segmentation tendencies* seen in the conventional labour market. Most service providers on both capital and labour platforms have multiple jobs, with conventional jobs as their primary source of income. The financial security provided by these conventional jobs protects them against the low incomes generally achieved with platform work in Denmark. However, there are also situations where our results support our notion that online income may contribute to *increased labour market segmentation*. This is especially the case where people's non-platform income sources provide limited shields of protection against income insecurity in the online labour market. Digital platforms may thus contribute to amplifying the risk of precariousness and to widening the labour divide, as research suggests that individuals with limited means are often willing to accept working conditions and wages below statutory labour standards (Wood et al., 2019). In other instances, our findings suggest that paid digital platform activities have the potential to *reduce labour market segmentation* as they serve as a path for upward labour and income mobility, for example for low-income groups supplementing their primary income with online income from capital platforms or even labour platforms. In such cases, labour platforms can act as a gateway to exit certain segments of the conventional labour market. Thereby, multiple jobholding in the platform economy may serve to bridge segments between the online and conventional labour market, thus reducing labour market segmentation rather than reinforcing the demarcations between the core and the peripheral labour markets (Schor et al., 2020).

Our findings also point to a situation where online income – in line with our expectations – reinforces segmentation tendencies seen in the conventional labour market, notably on capital platforms where people on high incomes utilise capital platforms to diversify income sources, thus implicitly strengthening their position in the traditional and possibly wider society. This calls for further research into the various subtypes of labour and capital platforms and their interaction with the conventional labour market, since some platforms such as crowdwork platforms may be more likely to provide upward mobility than platforms involving low-paid gig work.

In sum, distinct sections of the digital platform economy appear to add another layer to the conventional labour market, though often with very different outcomes: people's online income in

combination with non-platform income seems to have a pivotal impact on labour market segmentation. Further investigation – including qualitative studies – is needed to explore the detailed interaction between the online and conventional labour markets, looking at how they evolve over time, especially as the platform economy is in many cases studied in isolation, with little consideration for the wider labour market and society.

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Appendix

Correlation matrix, 2017 variables	Income	Gender	Age	Educational level	Employment	Foreign-born
Income	1					
Gender (0 = Male, 1 = Female)	-0.1393	1				
Age	0.3999	-0.1264	1			
Educational level	0.3952	0.089	0.0181	1		
Employment	0.5482	-0.1019	0.141	0.3479	1	
Foreign-born	-0.0285	0.0015	0.0294	0.0029	-0.0467	1
N = 97,787						

Correlation matrice, 2019 variables	Income	Gender	Age	Educational level	Employment	Foreign-born
Income	1					
Gender (0 = Male, 1 = Female)	-0.2121	1				
Age	0.488	-0.0537	1			
Educational level	0.4238	0.1144	0.1314	1		
Employment	0.4663	-0.1345	0.1522	0.2221	1	
Foreign-born	-0.1498	0.1356	-0.0229	-0.1236	-0.1199	1
N = 94,742						