

Externalities of Crowd working Platform and the Role of the Government

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Abstract

This paper investigates the impact of the platform economy on the transition of the labor market, with a specific focus on crowdworking platforms. It aims to bridge the gap in the existing literature by assessing the effectiveness of government policies in addressing the challenges and opportunities presented by the platform economy. The study explores both the positive direct effects, such as job creation and increased labor market participation and the negative direct and indirect effects, including job insecurity and environmental externalities. Through a comprehensive literature review and policy analysis, the paper evaluates the role of government interventions in maximizing the positive outcomes and mitigating the negative consequences of the platform economy. Key findings indicate that while the platform economy facilitates flexible work arrangements and employment opportunities, it also necessitates robust policy measures to ensure job security, social protection, and environmental sustainability. The study demonstrates the validity and value of framing the impacts of platform-based labor market transitions as externalities of commerce that can be managed by municipal and federal policies and tools.

Key words: crowd working, less job security, job creation, government intervention, external-ity.

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1 Introduction

With the development of digitalization and automation, more and more manual, routine labor is being replaced. As expected, up to 50% of the jobs currently performed by humans will be performed by robots or digital machines in the next 20 years (Frey and Osborne (2017); Brynjolfsson and McAfee (2014); Ford (2015); Düll et al. (2016)). Plus, increasing globalization causes the difference in job opportunities between areas. Thus, nowadays, precarious and non-standard work forms caused by the transformation of the labor market are common. All these problems promote a new type of labor market: crowd work.

The very nature of crowd work is not a new occurrence. Similar historical trends in the labor market have been around for decades. The revolutionary shift that makes crowd work different is the utilization of online platforms. A crowd working platform is a digital platform that enables a large number of workers to each contribute a portion of their work. Though technological development and globalization created job instability and loss, it also brought upon opportunities in this field. The widespread adoption of the internet and digital platforms can be credited to the existence of crowd working platforms. Globalization has enabled digital platforms to operate internationally, allowing these large platforms and corporations to employ crowd workers from all over the world. Typical examples of said crowd work platforms include e-hailing platforms, such as Uber and Didi Taxi, which are virtual platforms that simplify the process of ordering forms of transportation. Other examples are food delivery platforms such as Uber Eat and Deliveroo which act as intermediaries between consumers and restaurants, as well as e-commerce platform

Crowd working is one of the new forms of gainful employment from the advancing digital platforms. (Jäger et al. (2019)) On the one hand, for employers, crowd working provides a full potential labor force for them to accomplish the workload with a permanent contract. For employees, crowd working breaks the conventional requirements, providing a more flexible and life-work-balanced working style. On the other hand, crowd workers are self-employed, and they cannot enjoy any social welfare. Plus, their wage is not guaranteed, which means they face the risk of wage dumping, i.e., the practice of paying lower wages than is usual in an industry (Astheimer (2015)).

Thus, what factors will affect people's choice to enter a crowd working platform? Individual

characteristics and circumstances emerge as The main positive effect caused by the rising platform economy on the labor market is job creation (De Groen et al. (2017)). For example, the platform economy facilitates job creation in fulfillment centers and e-commerce companies, and the e-commerce industry's income surpasses the traditional retail sector. (Mandel, M. (2024)). Gelder, K. van. (2024) mentions the phenomenon of growth in e-commerce consumers with specific data. Also, the Center for European Policy Studies (CEPS) claims that digital platforms provide more job opportunities with lower barriers to entry. Compared with traditional jobs, crowd work is more flexible than conventional jobs (Groen et al. (2017)), which attracts more workers who are only available in fragmented time. Plus, according to Altenried (2020), the platform economy helps labor overcome spatial and physical obstacles. Consequently, the potential of the labor force could be maximized to the greatest extent possible.

However, the platform economy also causes increasing unemployment and less job security in crowd working platforms. One of the main issues of the platform economy is the unequal treatment of crowd workers. To better explain, crowd workers usually enjoy less social welfare, employment benefits (Gruber, 2024), and lower income than traditional workers (Cantarella and Strozzi (2019)) For example, a 2021 UK-based study found that 52% of gig workers earned below the then-UK minimum wage (Wood et al. (2021)). This can be attributed to various reasons but the most prominent one is due to platform workers being considered as independent contractors, which means these workers are self-employed. This also leads to them being exempt from minimum wage laws and normally required employee benefits, such as retirement plans and health insurance. If a platform worker were to get injured on the job, there would be no payment during that time of absence. Platform workers are also unable to comfortably retire from the job, as there is no retirement payment for these independent contractors. The unequal treatment is also attributed to unpaid labor. There are two types of unpaid labor, non-time-based and time-based. Non-time-based labor refers to fees that would regularly be paid for by a company, that now are left in the hands of the workers inside the platform economy. This includes fees for vehicle maintenance, work equipment, technology, and more. The second type of unpaid labor is time-based labor. This refers to the tiring and large amount of time that platform workers spend idly in unavoidable situations such as waiting for orders. This is also detrimental to platform owners as the human capital and profit of their workers are not being utilized to their full potential. Aside from the instability, lack of

benefits, and profits of the platform economy, another danger that platform workers face is job insecurity due to rising automation. Besides, automation has been increasing and encouraged in the platform economy, with more and more platforms shifting towards it. Therefore, a large number of crowd workers will lose their jobs because of the lack of competition compared with artificial intelligence. A prime example is the telecommunications industry, which is now both a platform and an automated industry. That has naturally led to huge job losses. The automation of AT&T for example, resulted in a near 50% reduction in its telephone operating force (Feigenbaum & Gross (2021)). The automation of cars will also arrive soon, replacing traditional cars and their drivers, putting millions out of employment as all self-service technology does (Otekhile & Zelený (2016)). Less job security is caused by the following two reasons: crowd working platforms misclassified workers as independent contractors to evade employment law obligations. Thus, many platform workers fall into a gray area between being employees and independent contractors, complicating the application of existing labor laws. Crowd workers find it hard to gain similar job welfare or protection as traditional workers. (Brishen Rogers, (2016)). Additionally, the work pattern of gig workers is more complex, some only work on one platform, and some are registered on multiple platforms at the same time; Some provide long-term and stable contract services, while others provide only temporary services; Some work full-time, some part-time. Therefore, it is difficult for society and companies to come up with an efficient labor protection welfare or social security system. (Li et al. (2022)). For this problem, *Employment Rights in the Platform Economy: Getting Back to Basics* mentions that several policy recommendations are proposed, including the introduction of a new worker classification that combines elements of both employee and independent contractor statuses. This hybrid classification would aim to provide basic employment rights while accommodating the flexibility of gig work.

For the environment, the platform economy causes negative externalities on third parties (Yang and Shi (2021)). First, the platform economy causes an increasing number of people to enter the e-hailing industry, which means the number of cars will rise. Hence, carbon emissions from traditional cars will increase. Plus, electrification, pooling, and automation techniques used in e-hailing impact energy use and so increase emissions of air pollutants and greenhouse gasses (Sheldon and Dua (2024)). Moreover, as the internet grows significantly and e-commerce surges, retail's negative environmental impact grows (Guerinot (2021)). Tiwari, S. and Singh, P. (2011) claim that

the environmental effects of e-commerce focus on three aspects: energy, resources, and pollution. Production and transportation are responsible for a large percentage of carbon dioxide emissions. Take the clothing industry in the U.S. as an example, the production phase is consistently responsible for the largest share of the environmental impact (Armstrong et al. (2021)), which requires large inputs of water, energy, and chemicals (Choudhury, (2014); Niinimäki et al., (2020); Roos et al., (2017, 2016)). The white and gray literature of clothing production and consumption also accounts for 8-10% of global GHG emissions (Quantis (2018); UNEP, (2018)). Moreover, long-term chemicals produced during transportation can also influence residents' health (Fried et al. (2024)). Additionally, the majority of products sold on these platforms are packaged in harmful plastic materials that are detrimental to the ecosystem (Sunita (2023)). Platform economy also has indirect negative effects on income distribution. Hoang, Blank, Quan, and Haase (2020) suggest that the platform economy widens earning disparities by providing additional income to people who already have good jobs. It should be segregated by occupation and examined as a set of distinct occupations rather than a homogenous industry.

Contribution

Despite evidence suggesting direct and indirect effects imposed by the platform economy on crowd working, few evaluations focus on the effectiveness of government policies in solving these problems. In contrast, most literature only explores the relationship between the platform economy and the labor market to discuss how the platform economy affects employment. While these discussions provide useful insight, they often fail to address the practical measures that can be taken by governments to mitigate the negative consequences and to enhance the opportunities provided by crowd work platforms. Our paper responds to this gap in the literature by assessing the existing policies to conclude the significance of the government in regulating the platform economy and evaluating its role in regulating crowd working platforms. We aim to investigate how policy interventions can protect vulnerable workers while still maintaining and promoting innovation and success within the platform economy. By matching and assessing the significance of existing policies with these problems caused by the crowd working, we display the effectiveness and limitations of each government intervention. Thus, we focus on how government intervention affects the effect caused by platform economy on the labor market, to explore to what extent could the government help to maximize the positive effect and minimize the negative effect caused by the

platform economy on the crowd working platform.

In general, Section 2, Literature Review provides relevant background information and a scholarly analysis to show the direct and indirect effects caused by the platform economy on crowd working. This section will also identify key gaps in the current literature and highlight areas where further research is needed to fully understand the impact of the platform economy. Section 3, Analysis and Discussion will introduce and analyze how the government plays a role in the platform economy. It will examine various policy or proposed policy responses worldwide, assessing their effectiveness in addressing the mentioned issues of the crowd working platform economy.

2 Literature Review

The transformation from traditional workers to crowd workers is facilitated by the increasing digital platforms and the gig economy. The main difference is that traditional workers are usually employed full-time or part-time with an employer, so there is a contract to guarantee workers can enjoy traditional employment benefits, like health insurance and retirement benefits. In contrast, crowd workers are usually self-employed and work based on online platforms. Plus, for work arrangements, since crowd workers are self-employed, they don't have a fixed workload and working environment compared with traditional workers. The occurrence of new job types causes most direct and indirect effects on the labor market and third parties. Hence, Section 2 through the literature review, focuses on the relationship between increasing platform economy and crowd working, and summarizes the effects caused by the platform economy on the labor market. We first discuss how more job opportunities occur when the platform economy becomes more mature, and then we explore both direct and indirect negative effects caused by the platform economy.

Positive direct effect

The positive direct effect of the platform economy to crowd workers is creating more job opportunities. According to De Groen, et al. (2017), the platform economy helps more people find jobs, like the ride-hailing industry, delivery industry, etc. Our essay focuses on three parts: the e-hailing industry, the food delivery industry, and e-commerce. Their essay provides a base for our essay because it states the positive direct effect of the gig economy on laborers. However, we

find a gap in their essay in that they do not mention the negative direct and indirect effects of the platform economy on the labor market. Therefore, in this essay, we will also point out the defects of platform economy influence on labor markets and value the policies to solve these potential problems. First, the platform economy helps workers overcome spatial and physical obstacles, which increases the population in the labor market. (Altenried (2020)). Altenried uses qualitative research methods, including interviews and case studies, to analyze how platforms like Amazon, etc. Their essay offers evidence of increasing human resources in the labor market due to the platform economy. Since crowd workers are all independent contractors, they can choose the flexible time they want to work, and they do not need to stay in the office all the time. Secondly, the employment rate and whole revenue in Europe increased because of the gig economy (Groen et al. (2017)). Authors use concise data to develop his claim that the platform creates more job demands in labor markets, which fulfills his essay more thoroughly. Furthermore, data exemplifying the increasing number of online e-commerce (World Economic Forum. (n.d.-a)). This literature helps exemplify the main positive direct effects of the platform economy on gig workers.

Negative direct effect

Despite creating opportunities and jobs, the platform economy still has an existing and incoming employment issue. Though able to attract workers, the platform economy has difficulty retaining them long-term. According to a 2016 report by JP Morgan, despite continuously attracting new workers, the platform economy also loses around half of its existing workers each year. (Farrell and Greig (2016)). Aside from this phenomenon, the rising automation in the platform economy will also cause millions of workers to leave the platform economy, but this is not by choice but by replacement. One crucial fact relevant to this topic is the label of platform workers. Platform workers are considered independent contractors instead of employees. This is arguably the root of most discussions and issues of the platform economy. The purpose of this literature review is to explore the unintended yet direct negative effects that come with the platform economy as well as dive into the existing literature on this topic. This literature review will act as both a basic foundation for research and support for arguments. The connection between the platform economy and employment issues can be separated into two main categories: voluntary withdrawal and structural unemployment. Voluntary withdrawal refers to the displeasure of platform workers which in turn causes a large number of workers to only stay in the platform economy for a

relatively short amount of time. Structural unemployment refers to a large number of platform workers losing their jobs at once due to one particular event, in this case, automation. Voluntary withdrawal is mainly due to the mistreatment of workers which can be further divided into two categories. The first category is that platform workers have low incomes and no benefits. This is due to the independent contractor label of platform workers. A 2021 UK-based study found that 52% of gig workers earned below the then-UK minimum wage (Wood et al. (2021)). This study by the University of Bristol provides a good perspective into the low compensation of platform workers and how that affects these individuals. However, this study is only UK-focused. While it may be a helpful representation of the platform economy, the lack of data from other countries should be acknowledged. A similar study, a 2022 American study states that 14% of gig workers earned less than the then federal minimum wage while 29% earned less than their state minimum wage (Zipperer et al. (2022)). This study by the Economic Policy Institute has similar disadvantages to the previous study by the University of Bristol. The study only utilizes data from one country, the U.S. However, an advantage of this study is that it is extremely detailed and provides more information on the low wages of the platform economy than most other studies. For example, the study provides data such as how 31% of gig workers could not fully pay their utility bills the previous month as well as how 62% of gig workers lost earnings due to technical difficulties. This leads to the second category of worker mistreatment, which is that labor is unpaid and wasted. Just as in the previous example on how gig workers often lose earnings due to technical difficulties, platform workers also often lose profit idly waiting for orders and customers. There are two types of unpaid labor: time-based and non-time-based. A 2021 article by Medium does a good job explaining this. It explains that time-based unpaid labor is mainly related to wait time, travel time, and search time while non-time-based unpaid labor is associated with workers paying for things like vehicle maintenance and work gear - things that would be normally paid for in a traditional work setting (Pulignano (2021)). This article, though containing no data or statistics, is valuable in explaining the features and basics of unpaid and wasted labor in the platform economy clearly and concisely. The wasted labor of the platform economy is also disadvantageous for platforms that miss out on profits that could have been earned if not for the wasted idle time. Contrasting with voluntary withdrawal due to mistreatment, structural unemployment is involuntary. The presence of automation is increasing in the platform economy each day and has already completely dominated some sec-

tors, such as telecommunication (Feigenbaum and Gross (2021)). A 2019 Forbes article predicted that cars are expected to achieve full self-driving capability by 2030 (Koetsier (2019)). Though this article is more than five years old and may have certain inaccuracies, it is undeniable that the arrival of self-driving cars will be short. With any new advances in technology, there always comes the loss of jobs and automation is no exception. A 2016 report claims that automation and its quick integration in various sectors render low-skilled workers jobless (Otekhile and Zeleny (2016)). This report published by the International Journal of Entrepreneurial Knowledge does not provide quantitative data but mainly focuses on discussing the general impact of automation on employment. One thing to take note of is that this report was published in 2016, and much has changed since then. Though the point stays the same, the arrival of automated cars will cause millions of platform workers in the driving and food delivery industry to lose their jobs. With the mistreatment from platforms added to the risk of automation threatening their employment, the employment issue of the platform economy remains significant. Though there is limited research and data on the platform economy, its issues are apparent. If these negative direct effects of the platform economy can not be fixed, they will be disadvantageous to platform workers, who lack justified compensation and platforms and lose out on profits. Another negative direct effect is less job security for crowd workers. It is difficult to classify workers in the platform economy under traditional employment categories, so many platform workers fall into a gray area between being employees and independent contractors. Therefore, it is hard for crowd workers to gain similar job welfare or protection as traditional workers. (Rogers and Brishen (2016)). Because of the current crowd worker market, crowd workers' job security faces challenges. They face the problem of less unemployment insurance, disability benefits, pensions, and health care, which all affect their daily life and their families. Secondly, the platform economy has become more and more complicated because some workers work on more than one platform simultaneously, or some workers work long-term, but some work only temporarily. As a result, it becomes gradually harder to ensure job security to crowd workers in such a complicated gig economy (Li (2022)). Last but not least, Schor, Attwood-Charles et al. (2020) mention in the essay that crowd workers work in the gig economy for their income only not earn income as traditional employees. Also, workers in the gig economy are vulnerable to changing market demand and management. Thus, crowd workers lack traditional employment benefits.

Negative indirect effect

Sheldon and Dua (2024) examined the global environmental impact of e-hailing services and published their study in *Environmental Research Letters*, highlighting the significant energy and environmental challenges posed by the rapid expansion of e-hailing platforms. The strength of this paper lies in a comprehensive analysis of how these services contribute to increased energy consumption and environmental degradation. For example, vehicle exhaust exacerbates the greenhouse effect. They also point out that due to the convenience of platform ride-hailing, there will be more users in the future, which also means more pollutant emissions in the future, which is serious. However, this review also has limitations. It dominantly focuses on environmental impacts without fully considering how to address the harmful consequences of gas emissions. With the remarkable growth of the platform economy and the advent of e-commerce, the negative effects of retailing on the environment have been exacerbated (Guerino (2021)). Tiwari and Singh (2011) emphasized a multitude of environmental impacts of e-commerce affecting energy consumption, resource use, and pollution levels. For example, the apparel industry, particularly in the United States, has shown significant environmental pressure during its production stage and has become the main contributor to carbon dioxide emissions (Armstrong et al. (2021)). This sector needs large amounts of water, energy, and chemicals, leading to environmental degradation (Chowdhury (2014)); Ninimaki and others (2020); (Ross et al. (2017/2016)). In addition, the life cycle of clothing production and consumption accounts for 8-10 percent of global greenhouse gas emissions (Quantis (2018)). United Nations Environment Program (2018)). Fred, Fermat, and Goddschild (2024) also stated that the long-term effects of chemicals used in production and transport may have adverse health effects on communities living near transport routes, such as skin diseases. While these studies provide an understanding of the environmental costs associated with e-commerce, they also reveal shortages. Armstrong et al (2021), for example, focus on the US, which may not fully reflect global changes in environmental impact. The platform economy problem needs to be analyzed in combination with global data to achieve the universality of the problem. Additionally, in terms of food delivery, more and more products sold through platforms are packaged in harmful plastics, which is called white pollution and largely damages the environment (Sunita (2023)). This reference does not have an in-depth study of the pollutants produced by food delivery other than plastics and their hazards, which will make it lack authority and applicability to other issues. The platform

economy also leads to income distribution problems, with some people thriving while others face social elimination (Hoang et al. (2020)). Research shows that while platforms can provide employment opportunities for many people, those who are able are more likely to take the opportunity to succeed and have high incomes, while other groups will not have it easy, which exacerbates the income gap. Hoang et al. 's study effectively highlights these differences but only analyzes the immediate impact of the problem, not its long-term economic and social impact.

3 Methodology & Analysis

This essay adopts a theoretical approach to assess and analyze existing policies solving the direct and indirect negative effects caused by the platform economy on crowd workers. The sources of policies are collected from journals, the organization's official websites, news websites, books, etc.

The analytical framework is the main method we use to help us evaluate the effectiveness and limitations of each policy. Based on the research of existing policies that governments used to reduce negative externalities, we make five criteria to help us categorize and evaluate these policies: type, application, where the externality that the policies want to reduce occurs, what economic impact the policy contains, and the limitation of this policy. According to these criteria, we list all five characteristics of each policy in our analytical framework. By merging these policies share similar characteristics, we classify existing policies into three categories: regulation, which is the setting of law; government intervention, which the government directly imposes on residents to reduce the production of negative externalities; and incentive-related policies, which through setting fines and pricing externalities to internalize these negative externalities.

Regulation

Compared with traditional workers, because crowd workers are self-employed, they lack contracts to guarantee their wages, stable workload, and job benefits like healthcare insurance and retirement benefits. Therefore, getting into crowd working means less job security.

The International Labor Organization proposes that the government needs to reform current laws to extend the social protection system to crowd workers to new groups of workers. (Inter-

national Labor Organization (2024)). If this policy is applied, crowd workers will have more job security than before, which means that they can enjoy more rights, like health care and retirement pay. At this time, crowd workers will live a better quality of life by the contribution of reforming the law. Secondly, senior workers will be benefited by the new law since this provides them with higher social security. It is hard for crowd workers to do part-time jobs at their platform, especially for elders, so a higher quality of social security will help them have a more comfortable life. Additionally, it is quite helpful to crowd workers who usually change their jobs. Some crowd workers change their jobs frequently because they are independent contractors instead of traditional employees, which means their jobs are not stable. Therefore, continuity of social insurance and workers' rights when moving from one job to another will ensure those workers with relatively stable jobs and rights in social protection. In addition, relevant institutions should promote simplifying enforcement procedures for crowd workers and traditional employees by automating contribution payment. (European Parliament. (n.d.), International Labor Organization (2024)). Simplifying procedures in payment effectively reduces the time cost since after the payment method has become easier, people do not need to wait for so long.

However, these policies still have problems in feasibility. First, the cost of reforming new laws to provide job security is a huge amount of money for the whole country. Especially for developing countries, this is too much for them to afford. Secondly, it often requires strong institutions and administrative systems to regulate the complicated lay systems. Otherwise, the laws will be reformed with even more errors. Besides, it is hard to find our target beneficiaries due to the limitations of data and resources. We aim to help more people, but the fact is it is challenging to find those groups that we try to help. As for the method to simplify the procedure, it increases the technological burden to make automating payment an easier method to pay. If we want to increase the ease of use and access for platforms and workers, we have to apply new technology, which needs a great many elites and a great amount of time to accomplish the goal. Second, it spends a great sum of money to financially support crowd workers in the platform economy. The accumulation of the intact cost will be a big number, unaffordable for some developing countries.

Similarly, government regulation is also effective in reducing the negative externalities on the environment.

First, the occurrence of the platform economy enables the e-hailing industry. More and more workers and cars get into the e-hailing industry to support rising demand. Hence, the total amount of carbon emissions from the e-hailing industry increases, harming residents' health. The World Health Organization (2024) has proposed a policy on e-hailing pollutants to shift to clean modes of power generation from fossil-fuel-powered vehicles. This means most drivers signed by the e-hailing platform need to drive electric vehicles. The policy is effective as it can significantly reduce emissions of pollutants such as nitrogen oxides and carbon monoxide, which contribute to poor air quality and associated health issues. The greenhouse effect would also be mitigated. The policy is also feasible. Nowadays, the rapid development of science and technology makes the price of electric vehicles meet mass consumption standards, and there is more and more shared charging infrastructure on the market. Thus, electric vehicles are completely convenient. Besides, most e-commerce occurs after the platform economy, which causes large amounts of wastewater in the production of clothing. To reduce this externality, WM (2019) developed a policy to enforce the use of water recycling systems. This requires manufacturers in the textile industry to use advanced equipment for recycling wastewater from the textile industry. This kind of equipment works to minimize the discharge of pollutants into water bodies, thus improving water quality to the standard of reuse. This method can significantly reduce the wastewater during the production of the clothes as well as the need for freshwater, contributing to environmental conservation. What's more, for feasibility, the device has already been tested and used. Due to the increase in online orders, not only does the production of clothes increase but also the frequency of transportation increases; thus, externalities produced in the transportation of products will increase. The policy to deal with the pollutants produced by E-commerce in express logistics is to implement Green Logistics Practices (Grant (2017)). Express delivery companies are asked to choose the best delivery plan and optimize delivery routes under the supervision of a satellite system. These practices minimize the carbon footprint and then lower the overall pollution generated during the transportation process. The modern advanced navigation system can automatically identify the road conditions of each optional route, including the distance, the number of traffic lights, traffic jams, etc., to give the courier a most reasonable and energy-efficient driving route. The e-commerce industry can work with navigation companies to implement this policy, which cannot incur high costs.

However, these policies have some limitations. First, it takes time to shift from conventional

cars to electric kinds, so the policy won't be immediately apparent. Besides, the production and disposal of batteries used in electric vehicles can also have environmental impacts, such as waste management challenges. These issues need to be addressed to ensure the overall sustainability of the policy. Plus, the initial cost of installing and maintaining advanced water recycling systems can be high. This will increase the financial burden on suppliers. In addition, because of the change of route, we need to adjust the number of warehouses or trucks, which takes a certain amount of time. This may also result in policies that do not immediately achieve significant reductions in pollutant emissions.

Government intervention

One of the direct problems of the platform economy is the unemployment issue. Most articles discuss that the platform economy causes a new demand for the labor force, thus, creating more job opportunities. However, the amount of people willing to work for the platform economy dwindles due to various reasons, such as income level, other job availability, and overqualification. Besides, increasing automation in the platform economy become the second reason for dwindling employment. This topic will only continue to become more prominent in the future since the advancement of automation is a popular trend that is inevitable and will naturally come with the loss of jobs.

In 2017, there was an EU proposal about increasing the rights of platform workers. Though it never got passed, the proposed methods in the document serve as good reference and inspiration. The plans for solving low income based on the EU document include minimum wage laws being adapted for platform workers, the reform of holiday pay entitlements for the schedules of platform workers, employee contracts including benefits, minimum wage, and guaranteed hours, and the introduction of higher minimum wage and compensation for workers exceeding the required hours. These proposed policies allow platform workers to have more fair financial compensation and employee benefits. They also make policies more inclusive for all different types of work, not only the standard 9 to 5.

Furthermore, for structural unemployment caused by technological development, the provision of training programs and subsidizing the relocation fees for workers are feasible. The main reason is that training programs could help workers reinforce their working ability and skills, which decreases the possibility of replacement. Subsidy for transportation, due to the technological de-

velopment based on region, subsidization gives workers more chances to search for jobs in other places. For example, unemployment in highly technologically advanced areas can consider relocating to other regions that still require more labor force.

However, what should be taken into consideration is people's willingness and government budget burden. Not all platform workers want the employee title even though being a platform worker is their main and full-time job. The freedom of being an independent contractor is undeniably part of the allure of the platform economy. Besides, the provision of subsidies on workers' relocation will affect the government investment in other aspects and, thus, enlarge the opportunity costs faced by the government.

What's more, for the negative indirect effect of income distribution, Berg (2020) states that Universal Basic Income (UBI) can relieve the issue of income inequality caused by the platform economy. UBI is a policy where all citizens receive a regular, unconditional sum of money from the government. The primary goal of it is to provide financial security. In the context of the platform economy—where many workers engage in gig or freelance jobs often characterized by irregular income and limited job security—UBI can play a significant role in mitigating the associated income disparities. This method is also easy to implement compared to the welfare system. Nevertheless, UBI's disadvantages cannot be ignored. First, it plays a high financial burden on the government as it increases government spending and potentially higher taxes or reallocation of funds from other public services. Second, it changes social dynamics as it lowers people's expectations about work and productivity. This may reduce the incentive for some workers to work, thereby affecting the labor market, people's responsibility, and mobility.

Incentive-related

Besides, Europe through set the Ultra Low Emission Zone to reduce the number of polluting cars and improve air pollution. If residents' vehicles don't meet the ULEZ emissions standards and aren't exempt, you need to pay a £12.50 daily charge to drive within the zone. This applies to cars, motorcycles, vans, and specialist vehicles (up to and including 3.5 tones) and mini buses (up to and including 5 tones). The implementation of Ulez effectively reduced the number of polluting cars and partly corrected the allocation of cars, so the allocation of resources can be improved. Furthermore, with the expanding Ulez, the total area of Ulez increases. Since low-emission cars

can prevent fines, consumers' purchasing preferences may change to be more willing to buy non-polluting cars, in the long run, although the government pauses the expansion, consumers may still consider purchasing low-emission cars. The policy can remain effective in reducing the over-provision of polluting cars and strengthening allocative efficiency. In addition, due to the £12.50 daily charge, the government budget will increase. Moreover, collecting fines can be used by the government to reinforce the scrapping scheme, remaining funds can subsidize drivers to switch to less polluting cars. Hence, people would have more incentive to buy cars that emit less pollutants. The reduction of polluting cars can be more effective, allocative efficiency can be reinforced. However, the large amount of drivers who were fined means the government needs to assign enough labor and facilities to supervise. If the expansion of clean-air zones costs a lot for monitoring, the government may consider reducing labor and facilities needed in Ulez to lower cost, so there may be an insufficient financial contribution to monitor clean-air zones in the later period, effectiveness of supervision in clean-air zones may decrease, overallocation of cars can not be dealt with effectively, and allocative inefficiency will not be corrected too much. Additionally, the popularity losses by the London government may limit the effectiveness of the policy. Fines from expanding Ulez caused the government to delay the implementation to avoid dissatisfaction increases. Therefore, easing the restriction of polluting cars may lead to the reduction implemented ineffectively, and allocative inefficiency cannot be corrected efficiently.

4 Discussion

Our essay demonstrates the validity and value of framing the impacts of platform-based labor market transitions as externalities of commerce that can be managed by municipal and federal policies and tools.

The literature we cited in our essay provides us with basic background information on the platform economy and the occurrence of the crowd work market. Also, it offers us specific data and numbers supporting the positive effects of the gig economy on crowd workers and the negative externalities we need to solve. However, the literature does not mention how the government maximizes the positive externalities and minimizes the negative externalities by current policies and potential proposals. Therefore, we analyzed the feasibility, effectiveness, benefits, and defects

of the policies matched to our current negative direct and indirect effects of the platform economy to crowd workers. We match different policies to current externalities of the gig economy on the crowd workers market and analyze the advantages and disadvantages.

Comparison of literature to our essay

This study analyzed the platform economy in terms of positive direct externality, negative direct externality, and negative indirect externality of the platform, intending to present the situation on its job creation, employment, types, and income distribution. Here is the comparison of the results of other studies and our main points.

De Groen et al. (2017) mention in their essay that a platform economy creates more job opportunities in the labor market by providing more flexible time and space and a low threshold in entering. Nonetheless, the gig economy cannot ensure job security for crowd workers like traditional workers because of the difficulty in classifying crowd worker groups and vulnerability to the fluctuating demand of the labor market.

Some detailed policy proposals that protect the rights of workers. Though this proposal was never passed, it is still helpful to observe these policies and take inspiration from them. (Forde et al. (2017))

Sheldon and Dua (2024) perform a systematic review of the literature on energy and environmental impacts of ride-hailing. In general, empirically, e-hailing has increased congestion, vehicle miles traveled, and emissions. However, theoretically, the potential for energy and emissions reductions in the future with increased electrification and pooling. Our finding substantiates that e-hailing has expanded substantially around the globe over the last decade and is likely to be an integral part of future transportation systems and caters to the former's view that platform ride-hailing causes a lot of air pollution.

Tiwari and Singh (2011) state that e-commerce cannot be now seen as a clean way of doing business as it can have some harmful impacts on the environment. In this article, we affirm this point of view and expand it: As the platform economy allows suppliers to have a larger customer base and consumers to shop online more conveniently, more and more orders are formed on online platforms, and the resulting consumption also increases. For example, excessive clothing production results in the consumption and waste of a large amount of water and other resources. However,

we focus on the consequences of e-commerce on the environment and how they can reduce the negative impacts of e-commerce but not spread awareness regarding these possible impacts among people.

Moreover, this article demonstrates that the income gap will be enlarged because of the platform economy since it widens earning disparities by providing additional income to people who already have good jobs. The platform economy is strongly segregated by occupation and it should be examined as a set of distinct occupations rather than a homogenous industry is the final finding of Hoang et al. (2020), which supports our findings in this article.

Additionally, the International Labour Organization (2024) points out proposals to solve problems created by the gig economy. Since crowd workers are independent contractors, they do not enjoy as much job security as traditional employees. They propose one policy to reform the law to give more groups of people job security, including elders and workers who frequently change their jobs. This policy supports our essay by stating the influence of the gig economy on the labor markets and how policies help solve these issues.

To further elaborate, the World Health Organization, which has a strong appeal, has also found that the rapid development has caused a large amount of vehicle exhaust to affect the environment, so it has set regulations to clean modes of power generation from fossil-fuel-powered vehicles. In this article, gas emission that pollutes the environment is increased because of the growing platform economy and e-hailing. Thus, we focus on the regulation of shifting the e-hailing conventional vehicles to the electric kinds which effectively drop the harmful gas emission.

Limitations

We still have limitations in our essay as follows. First, we focus only on the crowd workers market by specific negative externalities and mainly three industries, e-hailing, e-commerce, and food delivery. Secondly, we cannot be fully objective in analyzing the policies' benefits and defects since we are human and have emotions and thinking. In addition, we cannot find all the policies related to the externalities of the platform economy, and all the resources and data supporting our direct and indirect effects of the gig economy on the labor markets. Moreover, our research cannot apply to other labor markets except crowd workers markets, like traditional job markets. Due to all the limitations we have, our essay cannot cover all the facets of the labor markets and the

platform economy. We might not mention all the negative and positive externalities of the platform economy. Besides, our essay focuses on only the current generation of the gig economy, so we should consider the possibility of the fast-changing platform economy. Future research should aim to solve more negative externalities by platform economy and how to deal with fluctuating change in the gig economy.

5 Conclusion

The purpose of this paper was to explore all the effects of the platform economy, as well as to advocate for proposed policies that can assist in alleviating its negative externalities. By analyzing consequences and suggesting solutions, this paper aims to inspire and provide reference to future researchers and advocates. The research is significant in how it contributes to the relatively small amounts of reports and data on the platform economy. It provides original ideas and insights, providing another valuable voice in this discussion. This paper could be further improved with more time, research, and resources to work with.

Our research question is: To what extent could the government help to maximize the positive externalities and mitigate the negative externalities caused by the platform economy on the crowd working platform? We have compiled existing and suggested policies that help answer this question and have the potential to improve the state of the platform economy. Our policies utilize government tools such as law reformation, green practice implementation, enacting job training, establishing protection laws, and more. By addressing these areas, the government can better the conditions of platform workers and partake in creating a more sustainable and improved platform economy. This paper can also serve as a reference for public policy, as it contains detailed information on beneficial plans and how they are to be enacted.

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