

LABOR MARKET ADJUSTMENTS THROUGH PART-TIMERS: EVIDENCE FROM BRITISH COLUMBIA'S CARBON TAX

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Abstract

Hiring part-timers becomes increasingly common. I exploit an exogenous cost shock of British Columbia's carbon tax to study how replacing full-time (FT) staffers with part-time (PT) workers shapes a labor market. Combining matching with a difference-in-differences approach, I uncover important yet underexplored mechanisms of labor market adjustments through PT switches. With PT switches occurring overwhelmingly among new hires, PT switches mediate labor hour cuts through labor turnovers. Due to a significant wage differential between FT and PT new hires, PT switches also mediate wage cuts, explaining approximately 20 percent of a hiring wage plunge. The switch is associated with additional involuntary part-timers, creating underemployment. This paper provides new micro-evidence on PT switches, offers new perspectives on labor market adjustments, and calls for policies mitigating labor market underutilization.

JEL Classification: E24, H23, J31, J63, Q52

Keywords: Carbon Taxes; Labor Market Adjustments; Wage Rigidity; Employment Flows; Employment Modes.

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1 Introduction

Since the mid-1990s, more than one in six American employees are part-time (PT) workers (Valletta et al., 2020).¹ With employers increasingly hiring more PT workers, interest in part-timers has increased. Yet, little is known about the causes and consequences of replacing full-time (FT) positions with PT workers. More primitively, we are yet to know the degree of flexibility to switch between FT and PT employment. While the canonical model of labor supply assumes a free choice of working hours for workers, a widespread view casts doubt by arguing that working hours are fixed within jobs and flexible across jobs (e.g., Chetty et al. (2011)). Meanwhile, a recent study of Borowczyk-Martins and Lalé (2019) provides empirical evidence that over business cycles, switching between FT and PT employments occur overwhelmingly within jobs. The theoretical assumption, the widespread view, and the existing empirical evidence seem equivocal.

This paper provides an in-depth study on PT switches. I explore whether PT switches occur within or across jobs, whether PT switches are voluntary, and whether PT switches mediate other labor market adjustments. These questions are important because they address economists' concerns on the degree of flexibility of hours change within and across jobs. They are policy-relevant: voluntary PT switches reflect workers' choices; nevertheless, involuntary switches may reflect the underutilization of productive capacity of labor forces, calling for labor market policies. These questions also help us understand the functioning of labor markets by exploring those important yet underexplored mechanisms of labor market adjustments through PT switches. Undoubtedly, a better understanding of the relationship between PT switches and other labor market adjustments help policymakers avoid the unwanted unintended consequences of labor market policies.

This paper studies PT switches from a negative shock to firms. Borowczyk-Martins and Lalé (2019) argues that the discrepancy between their surprising results—flexible PT switches within jobs—and others, which support hours constraints within jobs, is partly attributed to the source of variations. While the majority of empirical studies identify hours constraints from shocks to workers, theirs are shocks to firms. Surprisingly, despite much research effort, there is a paucity of conclusive evidence identifying the causal effects of shocks to firms on PT switches.

To establish a causal relationship, I exploit a unique opportunity provided by the introduction of a carbon tax policy in the Canadian province of British Columbia (BC). This policy provides an ideal platform to study how a negative shock to firms shapes the labor market through PT switches. First, a carbon tax increases marginal cost of production, creating a cost shock to firms and potentially inducing labor market adjustments. Second, the policy was introduced in BC only; hence, it provides numerous control labor markets from the rest of Canada (ROC). Third, it was implemented on July 2008; therefore, the pre- and the post-policy periods are clearly defined. Fourth, the initial carbon tax was so high that the public is aware. This awareness is important to ensure industries respond to the policy. Otherwise, it becomes difficult to distinguish the existence of hours constraints from the public unawareness of the policy. Indeed, Yip (2020) shows that BC's carbon tax creates job and wage losses, ensuring industries'

¹I also show in Figure A1 in the online Appendix that part-timers become increasingly common in many countries.

responses to the policy and thus allowing for the analysis on the degree of flexibility of working hours. Fifth, the policy provides a novel source of an exogenous variation in the stringency of the shock because the tax rate increased annually in the first five years. These five appealing features allow me to identify the causal effects of BC's carbon tax on PT switches with the coarsened exact matching (CEM) method and the difference-in-differences (DID) approach.

I provide evidence that firms mediate labor hour cuts through labor turnover. I find that a cost shock to firms, like BC's carbon tax, causes PT switches overwhelmingly among new hires, consistent with the widespread view of hours flexibility across jobs. This finding suggests that hours constraints may hinder allocation between FT and PT employment within jobs. Moreover, I find that the shock increases the number of involuntary PT new hires, creating underemployment. During the early stage of the policy, all additional underemployed new hires actively look for FT jobs. In the later stage, many underemployed new hires do not seek FT jobs even though they want to work FT, creating discouraged underemployment—PT workers who want to work FT but have stopped seeking FT jobs. These findings call for policies to mitigate the labor market underutilization through involuntary PT switches.

Furthermore, I uncover an important yet underexplored mechanism of wage adjustments through PT switches. An incumbent wage effect is negligible because the wages of FT and PT incumbent workers are rigid. I find that a wage differential between FT and PT workers decreases with the length of tenure. Among incumbent workers, this wage differential is small; as a result, the wage effect associated with their PT switch is tiny. Meanwhile, average hiring wages plunge because the wages of their FT and PT workers plunge. Due to a significant wage differential between FT and PT new hires, the increasing popularity of PT new hires fuels the hiring wage plunge, explaining approximately 20 percent of the plunge. Average wages continue to decrease with a gradual increase in the proportion of new hires in employment.

These findings enhance our understanding of labor market adjustments. While it is a commonplace to say that wage cuts are alternatives to layoffs, I find that turnovers and PT switches jointly mediate labor hour and wage cuts. These findings reveal that a complete understanding of labor hour and wage adjustments requires an explanation of employment flows—the inflow and outflow of employment—and employment modes—switching between FT and PT employment.

This paper contributes to two strands of literature. First, most of the contributions in the literature of labor working hours identify hours constraints from stated labor preferences (Kahn and Lang, 1991; Dickens and Lundberg, 1993; Stewart and Swaffield, 1997; Bryan, 2007) or worker-level idiosyncratic shocks such as variations in family compositions (Altonji and Paxson, 1992), tax/benefit incentives to work (Blundell et al., 2008), individual financial situations (Benito and Saleheen, 2013), etc. On the contrary, Borowczyk-Martins and Lalé (2019) finds that over business cycles, transitions between FT and PT employments occur overwhelmingly within jobs. They argue that their surprising findings differ from the widespread view because business cycles are largely driven by shocks to firms, not shocks to workers as in the earlier literatures. The present paper bridges between the two: it studies PT switches under a shock to firms (i.e., a carbon tax shock) as in Borowczyk-Martins and Lalé (2019) and it zooms into one episode—BC's carbon tax—to estimate the causal effects as in the earlier literature (Blundell

et al., 2008; Benito and Saleheen, 2013). Moreover, this paper complements prior studies by identifying the discouraged underemployment and other labor market adjustments through PT switches.

Second, this paper speaks directly to the literature that investigates the impact of environmental policies on labor markets. Thus far, a vast body of literature has paid attention to job losses (i.e., the extensive margin of employment) created by environmental policies in a manufacturing sector (Greenstone, 2002; Walker, 2011; Kahn and Mansur, 2013) and in the whole economy (Yamazaki, 2017; Hafstead and Williams, 2018; Yip, 2018; Castellanos and Heutel, 2019; Yip, 2020). None of these studies, however, focus on the impact on the intensive margin of employment. This paper fills the gap by investigating how an environmental policy (i.e., BC's carbon tax) shapes a labor market through the intensive margin of employment—PT switches. Meanwhile, recent studies discover earnings losses (Walker, 2013; Curtis, 2017) and wage losses (Yip, 2020) created by environmental policies. This paper complements these studies by revealing important mechanisms of labor market adjustments to environmental policies: firms hire part-timers to mediate hour and wage cuts. Beyond the documented job and wage losses in the literature, this paper uncovers an important yet often overlooked social cost of environmental policies—the labor market underutilization due to involuntary PT switches.

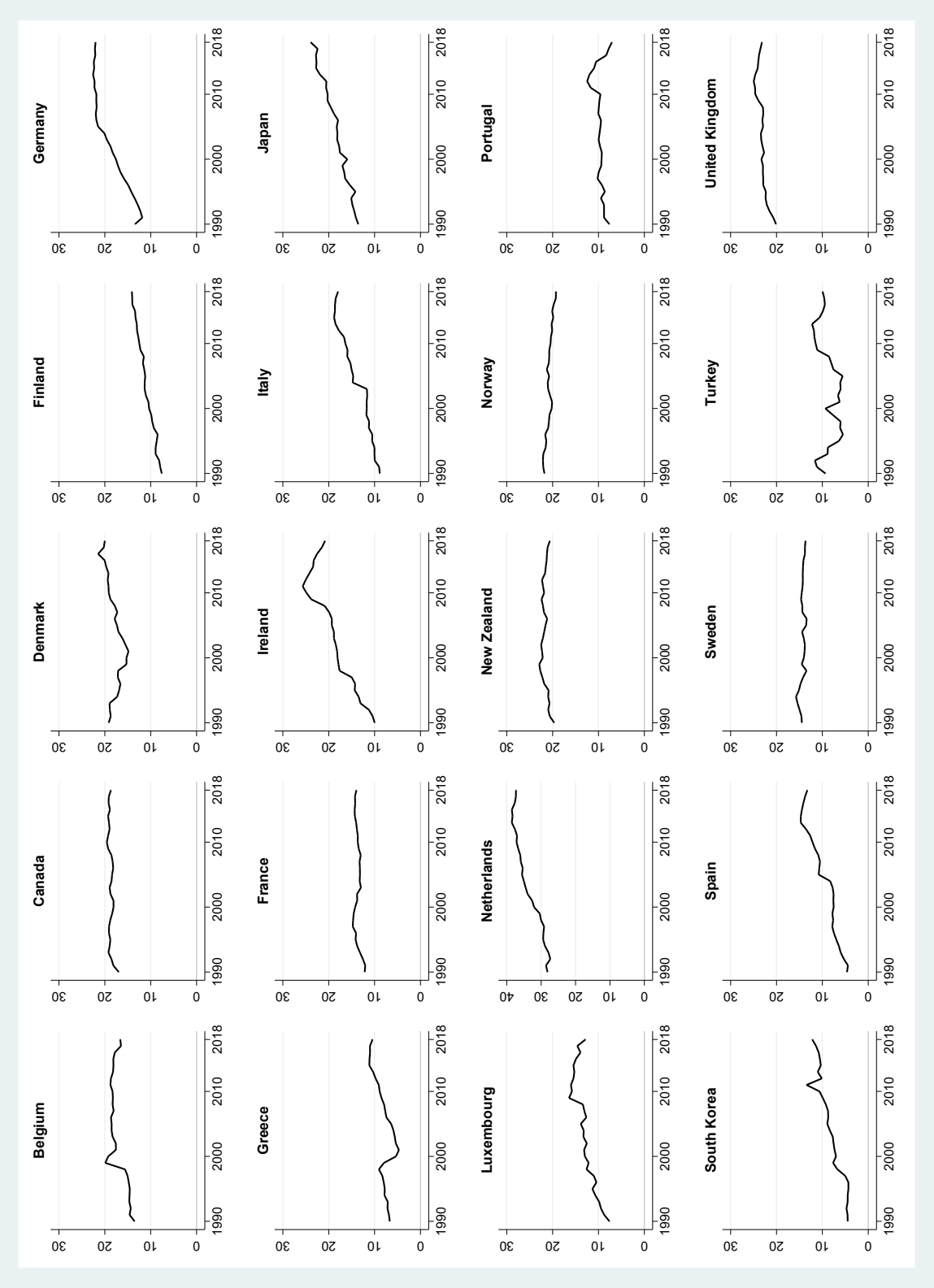
This paper also contributes to the literature that evaluates the performance of BC's carbon tax. Yip (2018) and Yip (2020) uncover the unemployment effect of BC's carbon tax. Yamazaki (2017) and Carbone et al. (2020) find that the employment effects of BC's carbon tax is heterogeneous across sectors: several sectors expand their employment, and many sectors shrink. However, these studies are silent on the impacts of BC's carbon tax on PT switches and how PT switches mediate other labor market adjustments (e.g., hour and wage cuts) to environmental policies.

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Figure 1: Part-Time Employment Rates Over Time



Note: The part-time employment rate is a fraction of part-time employed people in employment. Part-time employment is defined as people working less than hours a week in their main job. Data are downloaded from OECD. I only reported countries without missing values from 1990 onwards.