Work Flexibility and Absenteeism: A Two-stage Residual Inclusion Approach

Ibrahima Diallo
Ph.D. Student, Department of Economics-Université Laval
ibrahima.diallo.11@ulaval.ca

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Motivation

- Workplace absenteeism is a common phenomenon that employers and co-workers encounter.
- Such absences are costly for individuals, families, colleagues and work groups, organizations and the economy as a whole (Goodman and Atkin (1984)).
  - Absence rates in Europe: between 3% and 6%; average cost: 2.5% of the GDP (Edwards and Greasley(2010)).
  - Absenteeism rate: 8.1% per full-time employee in 2011 (Dabboussy and Uppal(2012); cost: $16.6 billion in 2011 (Stewart (2013)).
- Various factors play a role in work absenteeism: sick leave, employment protection, disability, age, depression, ... (De Paola et al. (2014), Henrekson and Persson (2004) and Ichino and Riphahn (2001)).
- Reducing workplace absenteeism is an issue for companies.

Motivation

- In recent years there has been growing interest in flexibility at work
  - 71.2% (very likely) 10.8% (already in FWA) (Employment and Social Development Canada, (2016)
- Top benefits of work flexibility
  - Improve employee work live balance
  - Positive impact on staff engagement and motivation (Casper and Buffardi, 2004)
  - improve worker health, through reduced stress and increased job satisfaction (Possenriede, 2011).
- Studies to date on the relationship between employment flexibility and work absence show an ambiguous effect
  - **Some forms of flexibility** (working regular hours, working on the weekend, working at home, and working a reduced work week) **decrease absence**, and **other form** like working flexible hours,working nontraditional hours, working in a shift, and working a compressed work week actually **increase absence** (Heywood and Miller (2015), Casey and Grzywacz, 2008, Dionne and Dostie (2007))

This paper

1. We study the impact of work flexibility on the probability of missing a workweeks.

2. We use the Survey of Labour and Income Dynamics to analyze the effects of working at home and part time work on absenteeism due to illness or personal/family reasons.

3. We use a variant of the instrumental variables method adapted to nonlinear models (2SRI) to take account for the potential endogeneity of working at home.

Literature Review

- Management literature
  - Dalton and Mesch (1990); Casey and Grzywacz (2008) find a negative relationship between flexibility and absence.
  - McGuire and Liro (1987) find no relationship between flexibility and work absence.

- Economist literature
  - Heywood and Miller (2015): working from home$^{(-)}$, flexible working time arrangements for non-managerial employees$^{(-)}$,job-sharing$^{(?)}$ and compressed weeks$^{(-)}$
  - Possenriede (2011): flexi-time$^{(--)}$, telework$^{(-?)}$ and part-time$^{(?)}$
  - Dionne and Dostie (2007): regular working hours$^{(-)}$, weekend work$^{(-)}$,working from home$^{(-)}$ and reduced work weeks$^{(-)}$ flexible working hours$^{(+)}$,non-traditional working hours$^{(+)}$, shift work$^{(+)}$ and compressed working weeks$^{(+)}$

Road Map

1. Data
2. Empirical specification
3. Results
4. Conclusion

Outline

Data

- Canadian's Survey of Labor and Income Dynamics (SLID)
- Longitudinal overlapping panel data on panel 3 to 6.
- We exploit the section on absences from work
- Information on absence from work, work from home, part time, health status, socio-demographic characteristics, job characteristics and industry.
- Sample restrictions
  - Age: 18-65;
  - Employment : **only employed workers** (Workers that are unemployed or not in labour market for part or all the period are excluded);
  - We consider workers that are stayed in the same job during the period;
  - We disregard individuals that have changed their region;

Descriptive statistics

Table: Descritptive statitics

Variables	Mean	Median	St.dev	N
Workweeks missed	7.9665	4	9.5603	20,757
Home work	0.0684	0	0.2524	20,757
Part time	0.2003	0	0.4002	20,757
Female	0.5644	1	0.4958	20,757
Handicap	0.2214	0	0.4152	20,757
Age	41.2574	42	11.6463	20,757
Wage	18.7181	17.5	7.4843	20,757
Under secondary education	0.1353	0	0.3421	20,757
Secondary education	0.3098	0	0.4624	20,757
Higher education	0.5548	1	0.4970	20,757
Married	0.6203	1	0.4853	20,757
Household size	2.9394	3	1.3739	20,757
Children (0-5 years)	0.1770	0	0.4896	20,757
Children (6-17 years)	0.4997	0	0.8585	20,757

Sources: SLID panels 3 to 6 and author calculation.

Descriptive statistics

Table: Descritptive statitics

Variables	Mean	Median	St.dev	N
Public sector	0.2948	0	0.4560	20,757
Union member	0.4715	0	0.4992	20,757
Number of employer				
Less than 20	0.2665	0	0.4421	20,757
20 to 99	0.3138	0	0.4640	20,757
100 to 499	0.2522	0	0.4343	20,757
500 to 999	0.0692	0	0.2539	20,757
1000 and over	0.0981	0	0.2975	20,757
Paid during absence	0.4744	0	0.4994	20,757
Regular shift	0.7401	1	0.4386	20,757
Profit sharing	0.0738	0	0.2614	20,757
Supervision	0.2673	0	0.4426	21,847

Sources: SLID panels 3 to 6 and author calculation.

Outline

Econometric model

We models decision to miss workweek

- Let U_{0i} the utility of not missing a workweek and U_{1i} the utility of missing a workweek

$$U_{0i} = \mathbf{x}_i'\beta_0 + \varepsilon_{0i} \quad (1)$$
$$U_{1i} = \mathbf{x}_i'\beta_1 + \varepsilon_{1i} \quad (2)$$

- Individual i misses a workweek at period t if

$$U_{1i} > U_{0i} \implies \varepsilon_{0i} - \varepsilon_{1i} < \mathbf{x'}_i(\beta_1 - \beta_0) \quad (3)$$

- Let

$$y_i = \begin{cases} 1 & \text{if} \quad U_{1i} > U_{0i} \\ 0 & \text{otherwise} \end{cases} \implies \text{Standard binary outcome model} \quad (4)$$

- With random repeated events of the same kind the distribution of the number of success is Poisson distribution (Cameron and Trived (2013))

Estimation procedure

The estimation method use the 2SRI approach (Terza et al. (2008))

- Let m_i be the number of workweeks missed. $m_i \sim Poiss(\mu_i)$

$$\mu_i = E(m_i|f_i, \mathbf{x}_i, u_i) = exp(\beta_1 f_i + \mathbf{x'}_{1i}\beta_3 + u_i) \tag{5}$$

where $u_i = \varphi\varepsilon_i + \nu_i$, ν_i is i.i.d, independent of ε_i, and $E[e^{\nu_i}] = cst$

1. First stage: Estimate a Probit regression and obtain residuals
   - Let f_i be the dummy variable equal 1 if workers hold a flexible job and 0 otherwise

$$f_i = \phi(\mathbf{x'}_{2i}\gamma) + r_i \tag{6}$$

   - We use provincial variation as instrumental variables
2. Second stage: Estimate Poisson including the residual obtained in the first stage

$$\mu_i = E(m_i|f_i, \mathbf{x}_i, u_i) = exp(\beta_1 f_i + \mathbf{x'}_{1i}\beta_2 + \varphi\hat{r}_i + \nu_i) \tag{7}$$

Outline

Results

Table: Standard Poisson and Two stage residual inclusion approach

	Poisson		2SRI	
Variables	Pooled	Panel	Pooled	Panel
Job flexibility (1=yes; 0=no)				
Work at home	-0.0173***	-0.0747***	-0.0167***	-0.0683***
	(0.000353)	(0.000862)	(0.000372)	(0.000923)
Part time	-0.0283***	0.0750***	-0.0283***	0.0750***
	(0.000228)	(0.000597)	(0.000228)	(0.000597)
Handicap (1=yes; 0=no)	0.539***	0.333***	0.539***	0.333***
	(0.000178)	(0.000392)	(0.000178)	(0.000392)
Gender (1=female, 0=male)	0.0690***	0.0807***	0.0690***	0.0806***
	(0.000209)	(0.000970)	(0.000209)	(0.000970)
Residuals			4.37e-05***	0.000434***
			(8.17e-06)	(2.27e-05)
Observations	20,757	10,467	20,757	10,467
Number of id		4,961		4,961

Note: Poisson regression model and 2SRI approach for relationship between job flexibility and absences from work with control for individual characteristics and firms. Standard errors in parentheses $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$

All Results

Results

Table: Robustness check

		Interaction		Misclassification errors	
Variables	Negative Binomial	Poisson	Negative binomial	Poisson	Negative binomial
Job flexibility (1=yes; 0=no)					
Work at home	-0.0241***	-0.0667***	-0.0514***	-0.0756***	-0.0672***
	(0.00104)	(0.000657)	(0.00170)	(0.000650)	(0.00168)
Part time	-0.0238***	-0.0280***	-0.0234***	-0.0218***	-0.0181***
	(0.000650)	(0.000228)	(0.000650)	(0.000224)	(0.000638)
Handicap (1=yes; 0=no)	0.548***	0.584***	0.592***	0.578***	0.588***
	(0.000561)	(0.000679)	(0.00211)	(0.000677)	(0.00211)
Gender (1=female, 0=male)	0.0758***	0.115***	0.0979***	0.133***	0.121***
	(0.000583)	(0.000698)	(0.00190)	(0.000689)	(0.0018)
Handicap×Work at home		-0.048***	-0.048***	-0.0467***	-0.0482***
		(0.0007)	(0.0021)	(0.000701)	(0.00218)
Gender×Work at home		-0.050***	-0.024***	-0.0678***	0.0502***
		(0.0007)	(0.0020)	(0.000710)	(0.00194)
Residuals	-0.000113***	-2.03e-06	-0.000148***	-0.00500***	-0.00584***
	(2.43e-05)	(8.16e-06)	(2.44e-05)	(6.19e-05)	(0.000204)
lnalpha	-0.133***		-0.133***		-0.127***
	(0.000359)		(0.000359)		(0.000358)
Observations	20,757	20,757	20,757	20,757	20,757

Standard errors in parentheses $***p < 0.01$, $**p < 0.05$, $*p < 0.1$

Outline

Conclusion

- We examined the association between job flexibility and job absences after controlling for individual and firm characteristics.
- We defined two forms of flexibility: working at home and part-time.
- We recognize that there is some geographical variation in the ability to offer flexibility, we use an instrumental variables approach to explore this potential source of bias.
- We then performed checks for overdispersion, heterogeneity, and misclassification which showed significant interaction effects while confirming the importance of flexibility.

THANK YOU
ANY QUESTIONS

Residuals

- Flowing Cameron and Windmeijer (1996)

$$\hat{r}_i = f_{it} - \hat{Pr}(f_{it}|\mathbf{x}_{2i}) \tag{8}$$

- Following Pagan and Vella (1989)

$$\hat{r}_i = \hat{Pr}(f_{it}|\mathbf{x}_{2i})^{-1/2}(1 - \hat{Pr}(f_{it}|\mathbf{x}_{2i}))^{-1/2}(f_{it} - \hat{Pr}(f_{it}|\mathbf{x}_{2i})) \tag{9}$$

- Geraci et al. (2018) shows that the last one are better predictors

Empirical specification

Result

VARIABLES	Pooled		Panel	
Work at home	-0.0173***	-0.0225***	-0.0747***	0.0111***
	(0.000353)	(0.000982)	(0.000862)	(0.00135)
Female	0.0690***	0.0758***	0.0807***	0.0921***
	(0.000209)	(0.000583)	(0.000970)	(0.000871)
Handicap	0.539***	0.547***	0.333***	0.296***
	(0.000178)	(0.000561)	(0.000392)	(0.000676)
2.agegroup	-0.0287***	-0.0379***	0.0986***	0.00852***
	(0.000381)	(0.00102)	(0.00126)	(0.00155)
3.agegroup	0.148***	0.153***	0.139***	0.0927***
	(0.000371)	(0.00102)	(0.00134)	(0.00152)
4.agegroup	0.200***	0.201***	0.263***	0.136***
	(0.000356)	(0.000983)	(0.00136)	(0.00147)
5.agegroup	0.224***	0.238***	0.482***	0.239***
	(0.000397)	(0.00112)	(0.00150)	(0.00161)
lnwage	0.0201***	0.0189***	0.196***	0.0610***
	(0.000277)	(0.000786)	(0.000849)	(0.00109)
2.educgroup	-0.00696***	0.0147***	-0.0520***	-0.0657***
	(0.000274)	(0.000797)	(0.00132)	(0.00113)
3.educgroup	-0.0103***	0.00617***	0.0232***	-0.0627***
	(0.000268)	(0.000779)	(0.00126)	(0.00109)
marstatus	-0.00820***	-0.0147***	-0.141***	0.00488***
	(0.000202)	(0.000569)	(0.000678)	(0.000814)
hhsz25	0.00228***	0.00212***	0.00456***	0.00606***
	(8.85e-05)	(0.000252)	(0.000286)	(0.000361)

Result

VARIABLES	Pooled		Panel	
children_0_5	0.116***	0.114***	0.108***	0.0665***
	(0.000194)	(0.000558)	(0.000602)	(0.000808)
children_6_17	-0.000327**	-0.00364***	0.0576***	0.00933***
	(0.000134)	(0.000386)	(0.000432)	(0.000538)
Public sector	0.0701***	0.0881***	0.0233***	-0.0164***
	(0.000232)	(0.000666)	(0.000881)	(0.000922)
Union member	0.136***	0.128***	0.143***	0.147***
	(0.000210)	(0.000594)	(0.000676)	(0.000828)
2.nbempl2	0.0433***	0.0421***	0.0190***	0.0527***
	(0.000229)	(0.000636)	(0.000638)	(0.000894)
3.nbempl2	0.0751***	0.0857***	0.0737***	0.0706***
	(0.000249)	(0.000707)	(0.000705)	(0.000960)
4.nbempl2	0.0522***	0.0419***	-0.0741***	0.000830
	(0.000373)	(0.00106)	(0.000899)	(0.00139)
5.nbempl2	0.142***	0.129***	-0.0145***	0.0985***
	(0.000331)	(0.000960)	(0.000874)	(0.00125)
pai_abs	-0.229***	-0.255***	-0.251***	-0.147***
	(0.000187)	(0.000535)	(0.000421)	(0.000690)
Part time	-0.0283***	-0.0238***	0.0750***	-0.0163***
	(0.000228)	(0.000650)	(0.000597)	(0.000896)
shift	-0.0366***	-0.0356***	-0.0338***	0.00930***
	(0.000196)	(0.000560)	(0.000497)	(0.000751)
pishare	-0.0119***	0.0112***	0.0867***	0.0395***
	(0.000338)	(0.000933)	(0.000751)	(0.00122)
supervision	-0.152***	-0.149***	-0.113***	-0.0698***
	(0.000206)	(0.000562)	(0.000484)	(0.000758)