Tracking and evaluation Labor Market Reforms in Europe

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The value of flexible contracts: evidence from an Italian panel of industrial firms

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What do we do?

- In the paper we want to find the value, in terms of wages, that firms attach to the possibility of hiring workers with fixed term rather than open ended contracts
- We exploit the introduction in Italy of a large tax credit in favor of firms hiring workers with open ended rather than fixed term contract
- This regulation allowed firms to trade labor cost for flexibility in the use of labor
- Since labor cost cuts differed across firms we take advantage of this variation to identify the actual rate at which firms have traded wage for flexibility.

The value of flexible contract

Formal definition

- We define the value of the flexible contract as the following semi-elasticity :

$$VFC = \frac{\frac{\Delta w}{w}}{\Delta\left(\frac{H^{oe}}{H^{ft} + H^{oe}}\right)}$$

- Value of flexible contract : Percentage reduction in the labor cost (of an open ended contract) that firms are willing to trade for an increase of one percentage point in the share of the total new workers hired with open-ended contract

How to compute VFC?

$$\log(\frac{H^{ft}}{H^{oe}})_{it}^{D} = \beta_0 + \beta_1 \log(\frac{W^{ft}}{W^{oe}})_{it} + \beta_2 TC_{it} + \beta_3 Z_{it} + \omega_{it}^{D}$$

$$\log(\frac{H^{ft}}{H^{oe}})_{it}^{S} = \gamma_0 + \gamma_1 \log(\frac{W^{ft}}{W^{oe}})_{it} + \gamma_2 SH_{it} + \gamma_3 Z_{it} + \omega_{it}^{S}$$

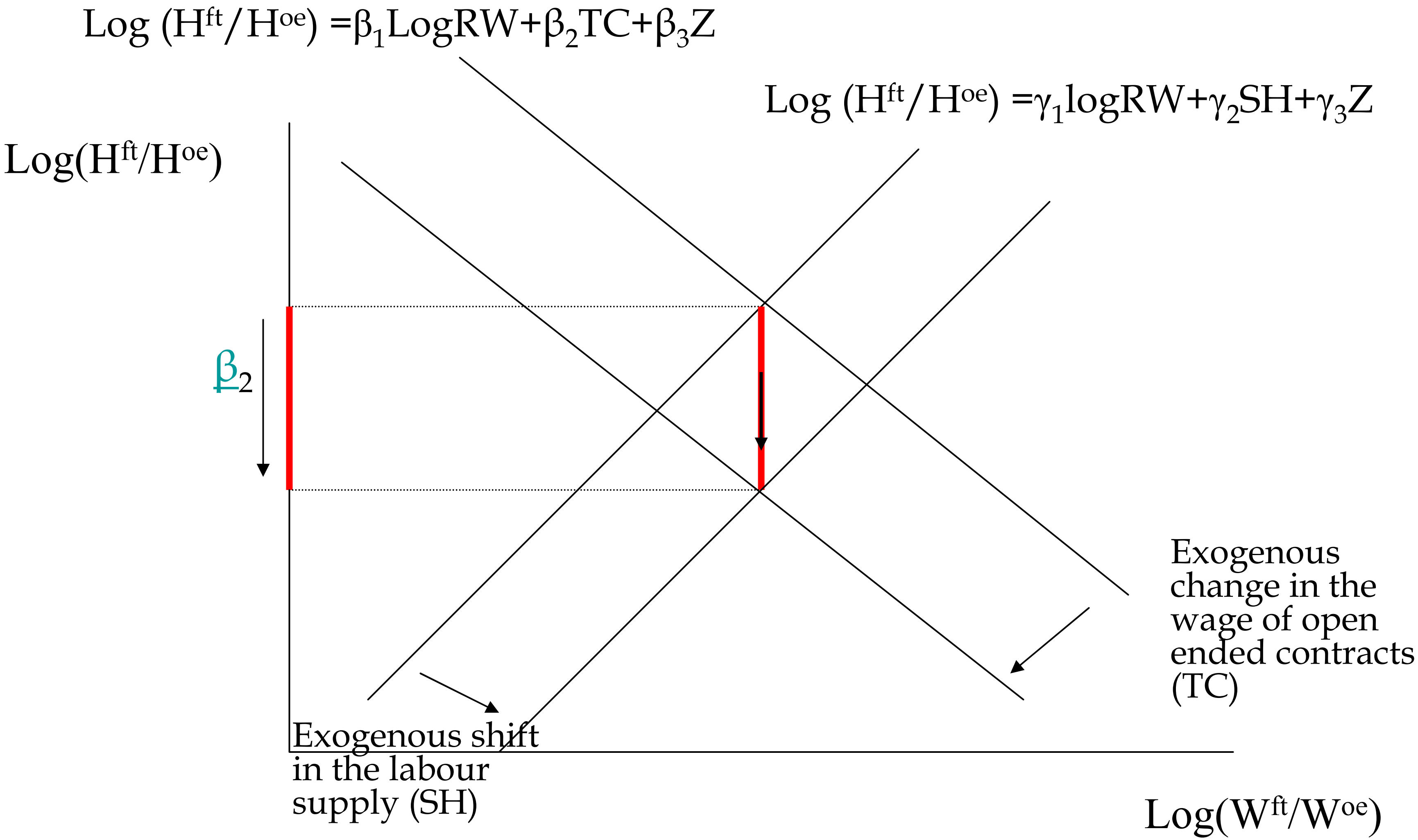
$$TC_{it} \equiv \log(\frac{W_{it}^{oe} - VTC_{it}}{W_{it}^{oe}})$$

Computation of VFC

$$VFC = \frac{\dfrac{vtc}{w^{oe}}}{\Delta\left(\dfrac{H^{oe}}{H^{ft} + H^{oe}}\right)}$$

$$\Delta\left(\frac{H^{oe}}{H^{ft} + H^{oe}}\right) = \frac{1}{k(1 - \dfrac{vtc}{w^{oe}})^{\beta_2} + 1} - \frac{1}{k + 1}$$

The Idea



$\text{Log}(H^{ft}/H^{oe}) = \beta_1 \text{LogRW} + \beta_2 TC + \beta_3 Z$
$\text{Log}(H^{ft}/H^{oe}) = \gamma_1 \text{logRW} + \gamma_2 SH + \gamma_3 Z$
$\text{Log}(H^{ft}/H^{oe})$
β_2
Exogenous change in the wage of open ended contracts (TC)
Exogenous shift in the labour supply (SH)
$\text{Log}(W^{ft}/W^{oe})$

ES2

The empirical specification

We could directly estimate the two reduce forms

$$\log\left(\frac{H^{ft}}{H^{oe}}\right)_{it} = b_0 + b_1 TC_{it} + b_2 SH_{it} + b_3 Z_{it} + \tilde{\nu}_i + \tilde{\varepsilon}_t + \tilde{\eta}_{it}$$

$$\log\left(\frac{W^{ft}}{W^{oe}}\right)_{it} = c_0 + c_1 TC_{it} + c_2 SH_{it} + c_3 Z_{it} + \tilde{\phi}_i + \tilde{\lambda}_t + \tilde{\mu}_{it}$$

To get the crucial parameter $\beta_2 = \frac{b_1(\gamma_1 - \beta_1)}{\gamma_1}$

where $\beta_1 = \frac{b_2}{c_2}$ and $\gamma_1 = \frac{b_1}{c_1}$

Life is never easy.

- No supply shifter(*)
- Data limitations(*)
- Econometric problems(*)

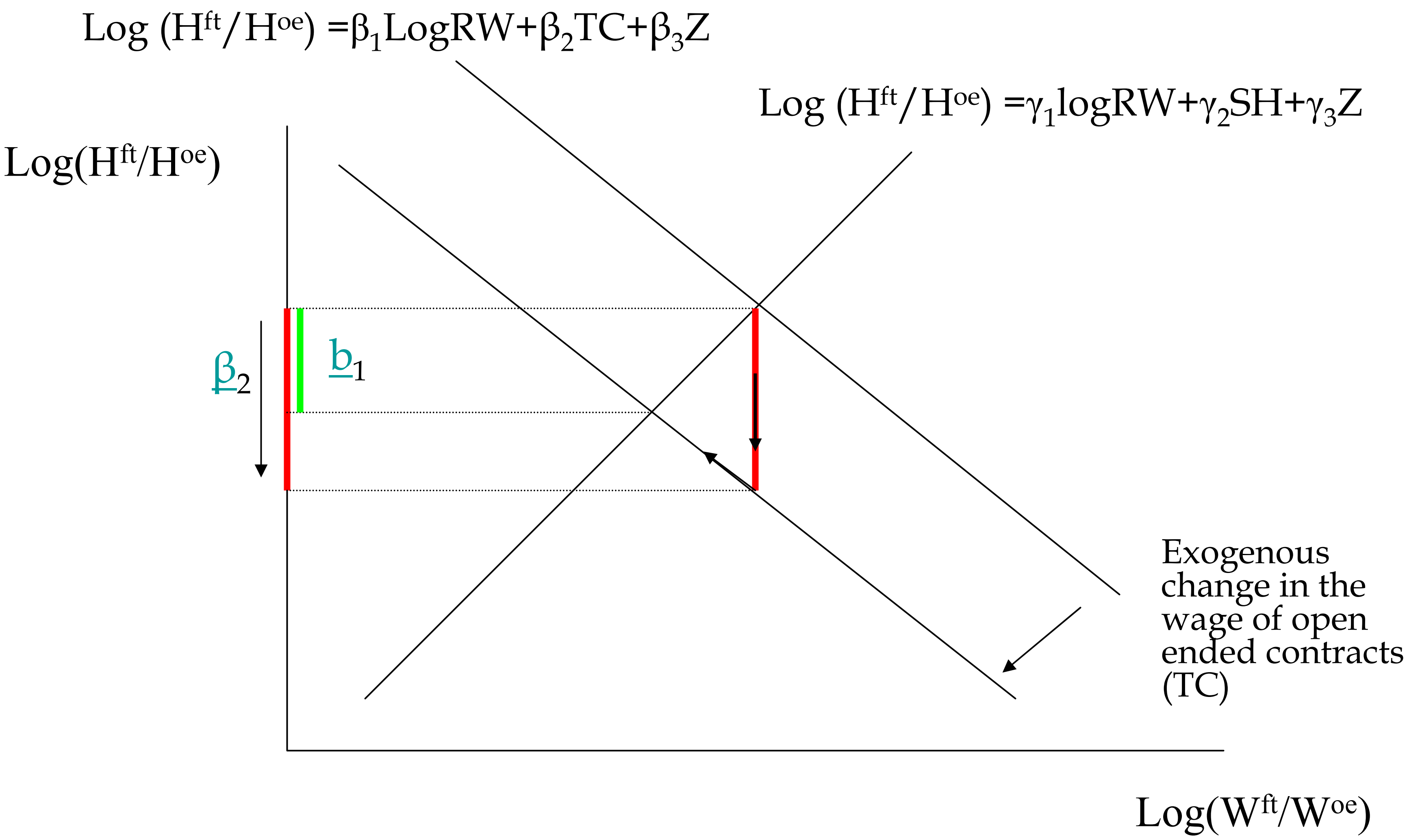
No labor supply shifter

- The lack of a labor supply shifter does not allow to identify b_2 and c_2 and therefore $\beta_1=b_2/c_2$

- Since $\beta_2=b_1(\gamma_1-\beta_1)/\gamma_1$ this crucial parameter is not identified

- However b_1 is still identified…

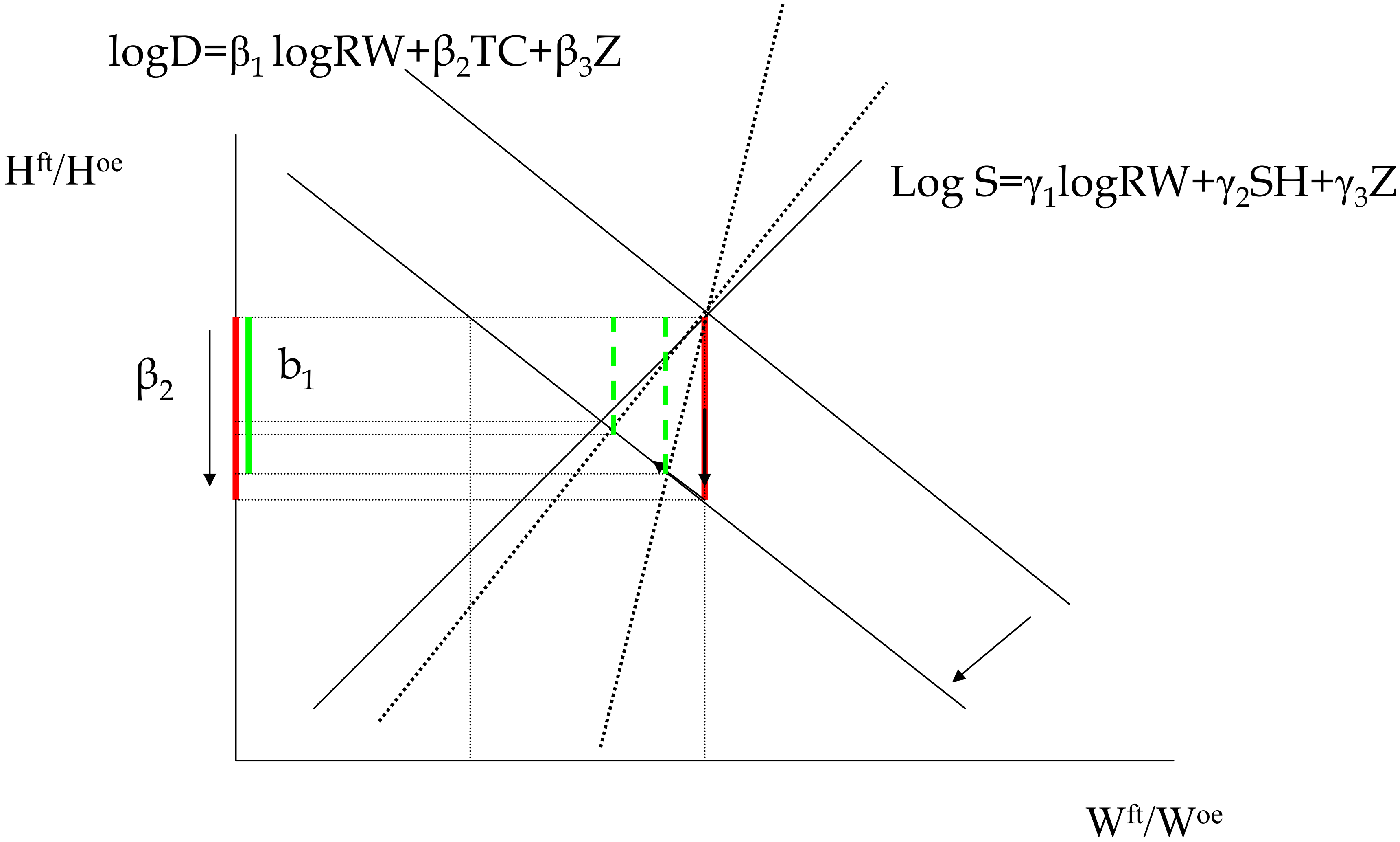
lack of a credible supply shifter



….and knowledge of γ_1 allow us to have some guess about β_2

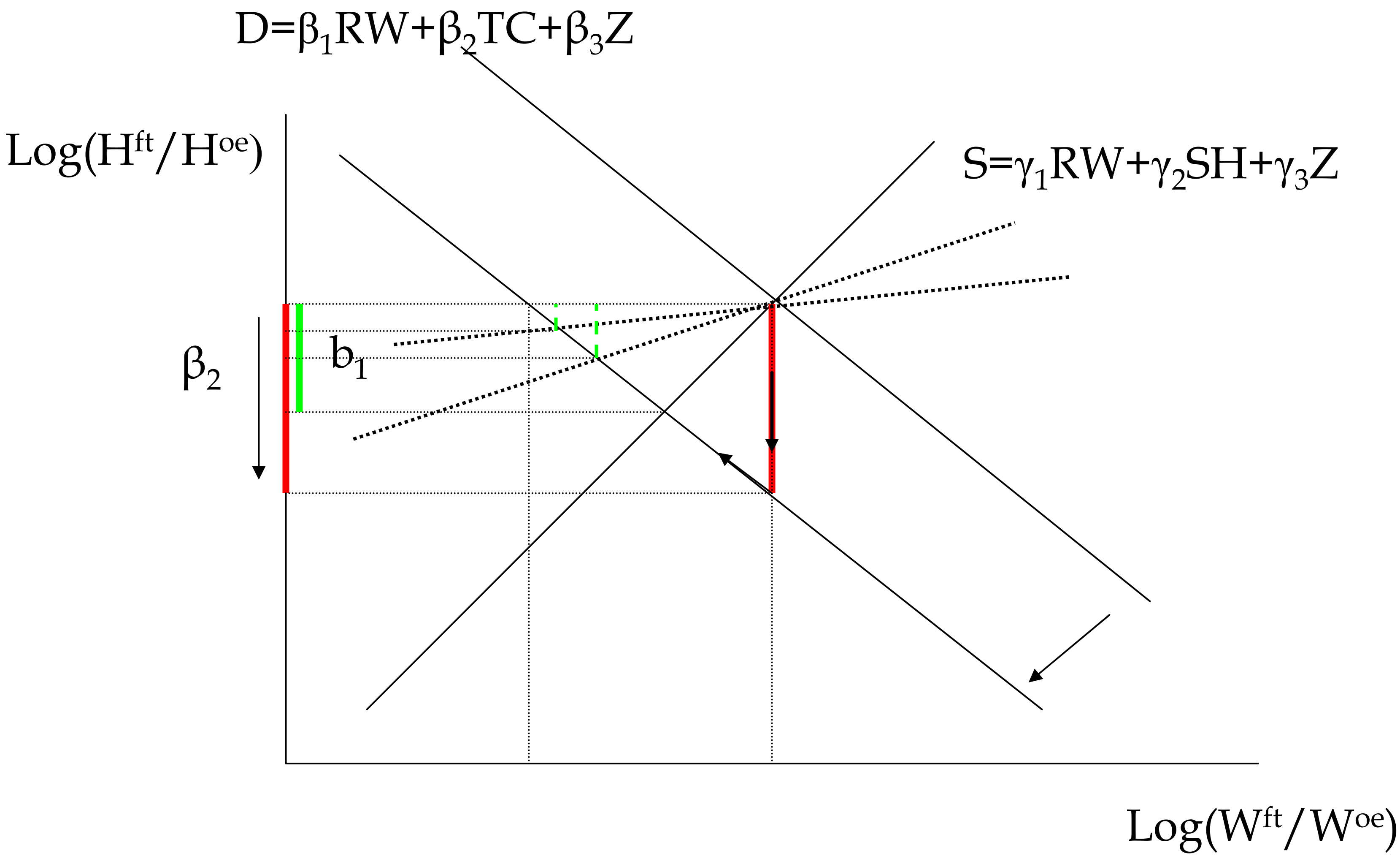
- If γ_1 is large $b_1 \Rightarrow \beta_2$
- if γ_1 is small $b_1 \Rightarrow 0$
- if $\beta_2 = -\beta_1 = \beta \Rightarrow \beta = b_1 \gamma_1 / (\gamma_1 - b_1)$

γ_1 large



$b_1 \Rightarrow \beta_2$

γ_1 small



$b_1 \Rightarrow 0$

The data

- We use data coming from “Federmeccanica” a survey of Italian firms in the engineering sector. We have access to micro data for the years 1997, 1998, 1999, 2001, 2002 (in year 2000 the survey was not conducted).
- We select only firms with a single plant, positive recruits of both open-ended and fixed term contract and in the sample in both 2001 and 2002
- We ended up with about 307 firms for a total of 938 observations.

Wages

- Federmeccanica does not provide wage by type of contract.
- Need to approximate
- Assumption: wage of fixed term workers=least two skilled groups among blue collars and least skilled group among white collars

Basic Information available on wage in Federmeccanica survey

	Categories	Employment		Average monthly earnings	Annual bonus	14^{th} payment	Firm level annual wage component
		total	females				
Apprenticeship							
Blue collars	1^{st}						
	2^{nd}						
	3^{rd}						
	4^{th}						
	5^{th}						
Special categories	4^{th}						
	5^{th}						
White collars	2^{nd}						
	3^{rd}						
	4^{th}						
	5^{th}						
	5^{th} S						
	6^{th}						
	7^{th}						
Managers	7^{th}						

Implications for the empirical specification

Because of the approximation in the wage definition, we first estimate a model that does not relay on wage information but exploits only the eligibility status

$$\log\left(\frac{H^{ft}}{H^{oe}}\right)_{it} = \tilde{b}_0 + \tilde{b}_1 DTC_{it} + \tilde{b}_2 Z_{it} + \tilde{\nu}_i + \tilde{\varepsilon}_t + \tilde{\eta}_{it}$$

$$i = 1 ..... 307,\ t = 1998, 1999, 2001, 2002$$

$$\Delta\left(\frac{\mathrm{H}^{oe}}{\mathrm{H}^{ft} + \mathrm{H}^{oe}}\right) = \frac{1}{\mathrm{k}_{it} \exp(\tilde{b}_1) + 1} - \frac{1}{k_{it} + 1}$$

Econometric problems

- ATE or ATT?
- No control for the eligibility status of the workers
- Time-varying, firm’s specific shocks
- Possible mechanical correlation between DTC and outcome variable

Endogeneity of DTC

$$\log\left(\frac{H^{ft}}{H^{oe}}\right)_{it} = b_o + \tilde{b}_t DTC_{it} + \zeta_{it}$$

$$b_{tOLS} = \tilde{b}_{1t} + \frac{\operatorname{cov}(DTC_{it}, \zeta_{it})}{Var(DTC_{it})}$$

For t=2001, 2002

$$b_{tOLS} = \frac{\operatorname{cov}(DTC_{it}, \zeta_{it})}{Var(DTC_{it})}$$

For t=1998, 1999

Identification strategies for $\tilde{b}_1$

Assumption	Test for the assumption	Estimator(s)
$\text{cov}(DTC_{it}, \zeta_{it}) = 0$	$b_{1,1999,OLS} = b_{1,1998,OLS} = 0$	$b_{1,2002,OLS}, b_{1,2001,OLS}$
$\text{cov}(DTC_{it}, \zeta_{it}) =$ $\text{cov}(DTC_{it'}, \zeta_{it'}) \neq 0$ constant over time	$b_{1,1999,OLS} = b_{1,1998,OLS} \neq 0$	$b_{1,t,OLS} - b_{1,t',OLS}$
$\text{cov}(DTC_{it}, \zeta_{it}) -$ $\text{cov}(DTC_{it'}, \zeta_{it'}) \neq 0$ constant over time	$b_{1,1999,OLS} - b_{1,1998,OLS} =$ $b_{1,1998,OLS} - b_{1,1997,OLS}$, no data for 1997	$(b_{1,2002,OLS} - b_{1,1999,OLS}) -$ $(b_{1,1999,OLS} - b_{1,1997,OLS})$

Implementing the strategies

$$\log\left(\frac{H^{ft}}{H^{oe}}\right)_{it} = b_{0,OLS} + b_{2,OLS} Z_{it} + \sum_{t=1998}^{2002} b_{1,t,OLS} DTC_{it} + \tilde{\varepsilon}_t + \tilde{\nu}_i + \tilde{\eta}_{it}$$

Pooling all data from 1998 and 2002 and estimate one b_1 for each year

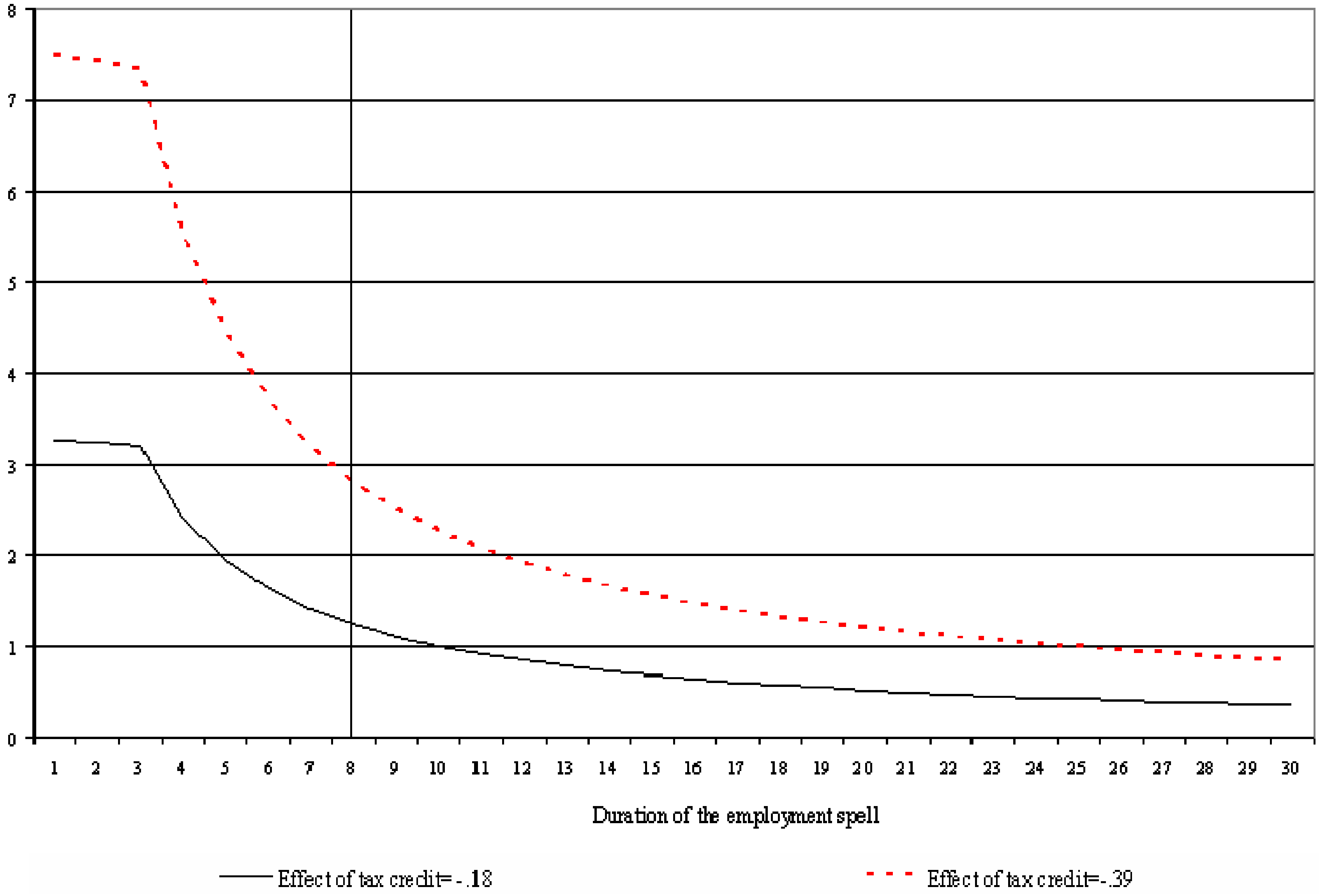
Results (parametric model)

	Model 1: no adjustment	**Model 2: Adjusted for fixed effects**	**Model 3: Adjusted for fixed effects and other covariates[2]**
Treated in 2002 ($b_{1,2002}$)	**-0.41**	**-0.44**	**-0.54**
	0.14	*0.13*	*0.14*
Treated in 2001 ($b_{1,2001}$)	**-0.39**	**-0.45**	**-0.47**
	0.15	*0.14*	*0.15*
Treated in 1999 ($b_{1,1999}$)	**-0.32**	**-0.25**	**-0.25**
	0.20	*0.17*	*0.17*
Treated in 1998 ($b_{1,1998}$)	**-0.30**	**-0.11**	**-0.08**
	0.20	*0.17*	*0.18*
Years fixed effect	*Yes*	*Yes*	*Yes*
Firms fixed effect		*Yes*	*Yes*
Other controls			*Yes*
Number of firms	*307*	*307*	*307*
Number of observations	*938*	*938*	*938*

Results (non parametric model)

	Model 1: no adjustment	Model 2: Adjusted for fixed effects	Model 3: Adjusted for fixed effects and other covariates[2]
ATT_{KM} in 2002	**-0.45**	**-0.39**	**-0.27**
	0.19	*0.10*	*0.09*
ATT_{KM} in 2001	**-0.39**	**-0.27**	**-0.18**
	0.15	*0.10*	*0.08*
ATT_{KM} in 1999	**-0.31**	**-0.18**	**-0.12**
	0.21	*0.11*	*0.13*
ATT_{KM} in 1998	**-0.27**	**-0.11**	**0.01**
	0.20	*0.15*	*0.13*
Number of firms	*307*	*307*	*307*
Number of observations	*938*	*938*	*938*

How much is VFC



Implications and conclusions

	Period 1995-2003
Estimated Value of Flexible contract	1.3-2.8 %
Employment growth	8.4 %
Output Growth	13.7 %
Employment growth granted by the pre 1995 elasticity (about 0.1)	1.4 %
Increase in the share of fixed term on total new contracts	8 pp (from 34 to 42)
Implied cut of the labor cost	10.4-22.4%
Long run elasticity of employment to wage (Bank of Italy quarterly model)	-.3
Employment growth granted by the increased flexibility	3.1-6.7%

Thanks !

4 of them

$$b_{1,2002,OLS} - b_{1,1999,OLS}$$

$$b_{1,2002,OLS} - b_{1,1998,OLS}$$

$$b_{1,2001,OLS} - b_{1,1999,OLS}$$

$$b_{1,2001,OLS} - b_{1,1998,OLS}$$

The tax credit (vtc)

- The Fiscal Law for year 2001 stated that for each new worker hired with an open ended contract firms would be rewarded with an automatic tax credit of about 400 euro per month (600 for workers in the south) from the moment of the hiring until December 2003.

- There were eligibility rules for worker: older than 24 and without a permanent job in the previous 24 months.

- Firms are eligible if the new worker increases the stock of permanent employees over the average employment of the period September 1999-September 2000.