Employment protection legislation and financial frictions: what drags Italian GDP down?

Giacomo Rodano, Alfonso Rosolia, Filippo Scoccianti
DG Economics, Statistics and Research

BANCA D'ITALIA
EUROSISTEMA

Medium- and long-run challenges for Europe
ESCB Research Cluster 2
Banco de España, Madrid, 16-17 november 2017

What we do...

Build a GE dynamic macro model with meaningful entrepreneurial choices that embeds two competing frictions – a size-dependent downward labour adjustment cost and a credit market imperfection – to study effects on the allocation of inputs across heterogeneous firms.

Calibrate it to Italy

What we do...

Build a GE dynamic macro model with meaningful entrepreneurial choices that embeds two competing frictions – a size-dependent downward labour adjustment cost and a credit market imperfection – to study effects on the allocation of inputs across heterogeneous firms.

Calibrate it to Italy

What we do...

Build a GE dynamic macro model with meaningful entrepreneurial choices that embeds two competing frictions – a size-dependent downward labour adjustment cost and a credit market imperfection – to study effects on the allocation of inputs across heterogeneous firms.

Calibrate it to Italy

What we do...

Build a GE dynamic macro model with meaningful entrepreneurial choices that embeds two competing frictions – a size-dependent downward labour adjustment cost and a credit market imperfection – to study effects on the allocation of inputs across heterogeneous firms.

Calibrate it to Italy

What we do...

Build a GE dynamic macro model with meaningful entrepreneurial choices that embeds two competing frictions – a size-dependent downward labour adjustment cost and a credit market imperfection – to study effects on the allocation of inputs across heterogeneous firms.

Calibrate it to Italy

What we do...

Build a GE dynamic macro model with meaningful entrepreneurial choices that embeds two competing frictions – a size-dependent downward labour adjustment cost and a credit market imperfection – to study effects on the allocation of inputs across heterogeneous firms.

Calibrate it to Italy

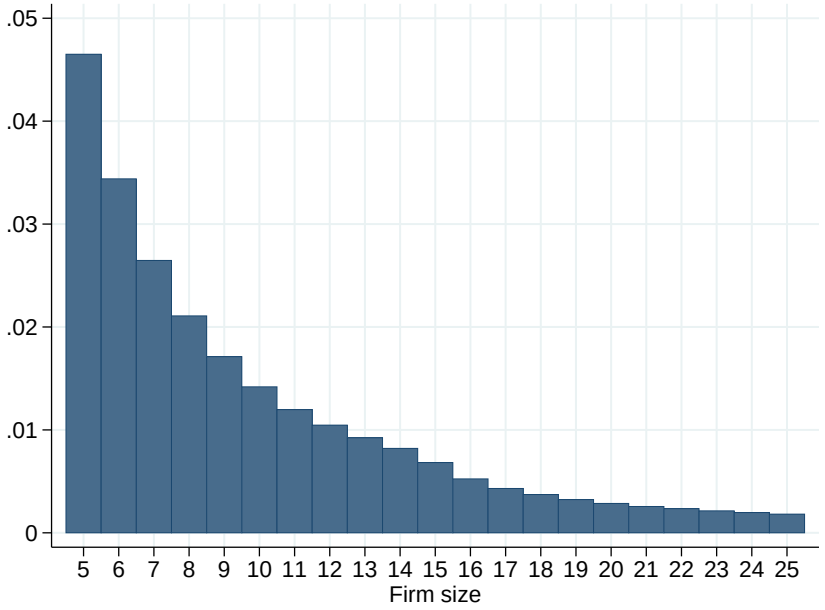
What we do...

Build a GE dynamic macro model with meaningful entrepreneurial choices that embeds two competing frictions – a size-dependent downward labour adjustment cost and a credit market imperfection – to study effects on the allocation of inputs across heterogeneous firms.

Calibrate it to Italy

Closest to Garicano, Lelarge, VanReenen (AER 2016) but no competing friction, no downward labour adjustment costs.

Size-dependent regulation: IT vs FR



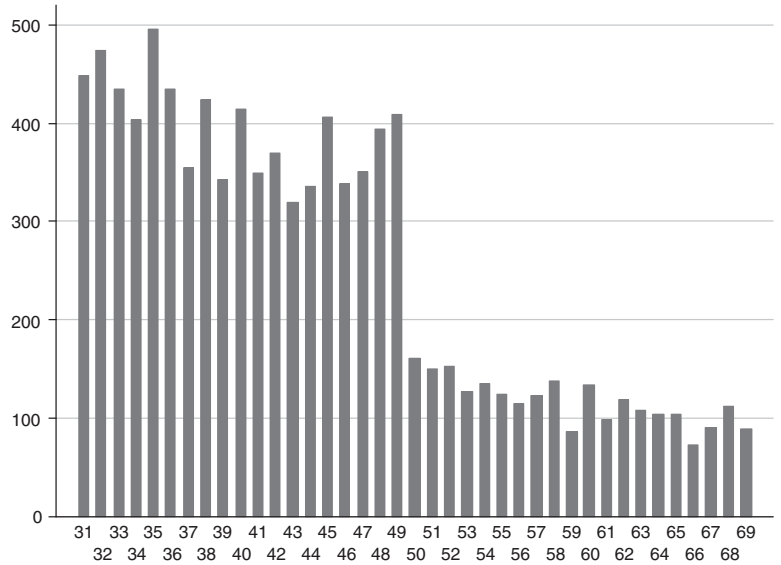
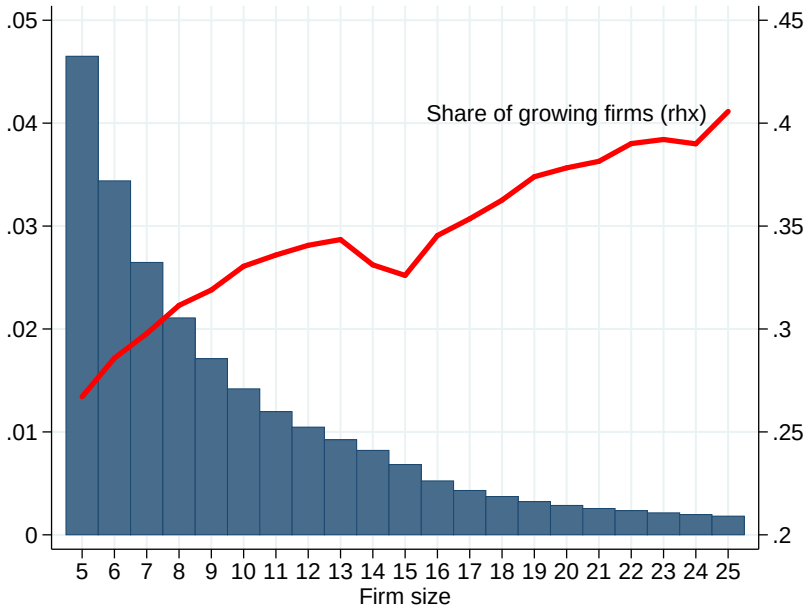


FIGURE 2. NUMBER OF FIRMS BY EMPLOYMENT SIZE IN FRANCE

Size-dependent regulation: IT vs FR



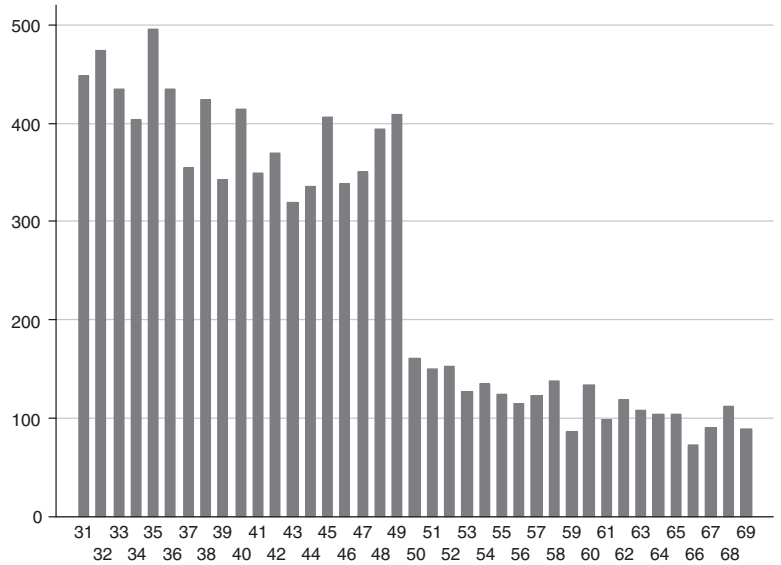


FIGURE 2. NUMBER OF FIRMS BY EMPLOYMENT SIZE IN FRANCE

In Italy stricter individual dismissal regulation above 15 employees (reformed in 2012-14)

The model

Every period agents choose to be employees or entrepreneurs given wealth (a), TFP (z) and previous occupational status (n_{-1})...

The model

Every period agents choose to be employees or entrepreneurs given wealth (a), TFP (z) and previous occupational status (n_{-1})...

$$V(a, z, n_{-1}) = \max_{c,k,n,a' \geq 0} u(c) + \beta E_{z'/z} \left\{ V(a', z', n) \right\}$$

The model

Every period agents choose to be employees or entrepreneurs given wealth (a), TFP (z) and previous occupational status (n_{-1})...

$$V(a, z, n_{-1}) = \max_{c,k,n,a' \geq 0} u(c) + \beta E_{z'/z} \left\{ V(a', z', n) \right\}$$

$c + a' =$

The model

Every period agents choose to be employees or entrepreneurs given wealth (a), TFP (z) and previous occupational status (n_{-1})...

$$V(a, z, n_{-1}) = \max_{c,k,n,a' \geq 0} u(c) + \beta E_{z'/z} \left\{ V(a', z', n) \right\}$$

$$c + a' = \begin{cases} w + (1 + r)a - FC(0, n_{-1}) & n = 0 \\ \end{cases}$$

The model

Every period agents choose to be employees or entrepreneurs given wealth (a), TFP (z) and previous occupational status (n_{-1})...

$$V(a, z, n_{-1}) = \max_{c,k,n,a' \geq 0} u(c) + \beta E_{z'/z} \left\{ V(a', z', n) \right\}$$

$$c + a' = \begin{cases} w + (1 + r)a - FC(0, n_{-1}) & n = 0 \\ zk^{\alpha} n^{\theta} + (1 + r)a - wn - (r + \delta)k - FC(n, n_{-1}) & n > 0 \end{cases}$$

The model

Every period agents choose to be employees or entrepreneurs given wealth (a), TFP (z) and previous occupational status (n_{-1})...

$$V(a,z,n_{-1}) = \max_{c,k,n,a' \geq 0} u(c) + \beta E_{z'/z}\left\{V(a',z',n)\right\}$$

$$c+a' = \begin{cases} w + (1+r)a - FC(0,n_{-1}) & n = 0 \\ zk^{\alpha}n^{\theta} + (1+r)a - wn - (r+\delta)k - FC(n,n_{-1}) & n > 0 \end{cases}$$

$$FC(n,n_{-1}) \quad = \quad I\left\{n_{-1} > 15\right\}\tau_I w \max\left\{0, n_{-1} - n\right\}$$

The model

Every period agents choose to be employees or entrepreneurs given wealth (a), TFP (z) and previous occupational status (n_{-1})...

$$V(a,z,n_{-1}) = \max_{c,k,n,a' \geq 0} u(c) + \beta E_{z'/z}\left\{V(a',z',n)\right\}$$

$$c+a' = \begin{cases} w + (1+r)a - FC(0,n_{-1}) & n = 0 \\ zk^{\alpha}n^{\theta} + (1+r)a - wn - (r+\delta)k - FC(n,n_{-1}) & n > 0 \end{cases}$$

$$\begin{aligned} FC(n,n_{-1}) &= I\left\{n_{-1} > 15\right\}\tau_l w \max\left\{0, n_{-1} - n\right\} \\ k &\leq \lambda a, \quad \lambda \geq 1 \end{aligned}$$

The model

Every period agents choose to be employees or entrepreneurs given wealth (a), TFP (z) and previous occupational status (n_{-1})...

$$V(a,z,n_{-1}) = \max_{c,k,n,a' \geq 0} u(c) + \beta E_{z'/z}\left\{V(a',z',n)\right\}$$

$$c+a' = \begin{cases} w + (1+r)a - FC(0,n_{-1}) & n = 0 \\ zk^{\alpha}n^{\theta} + (1+r)a - wn - (r+\delta)k - FC(n,n_{-1}) & n > 0 \end{cases}$$

$$\begin{aligned} FC(n,n_{-1}) &= I\left\{n_{-1} > 15\right\}\tau_l w \max\left\{0, n_{-1} - n\right\} \\ k &\leq \lambda a, \quad \lambda \geq 1 \end{aligned}$$

$$z' = \begin{cases} z & \text{with prob} \quad (1-\psi) \\ \text{Pareto}(s) & \text{with prob} \quad \psi \end{cases}$$

The model: a few considerations

FC have no upsides (risk sharing, efficient UI, incentive compatible compensation and training schemes).

Firms cannot circumvent FC by using temporary contracts (Hijzen et al 2013) or by shifting costs on workers through lower wages (Leonardi&Pica 2013).

TFP process implies high expected costs on more productive (larger) firms ($\frac{\partial \text{Prob}(z' \leq z)}{\partial z} > 0$).

The model: a few considerations

FC have no upsides (risk sharing, efficient UI, incentive compatible compensation and training schemes).

Firms cannot circumvent FC by using temporary contracts (Hijzen et al 2013) or by shifting costs on workers through lower wages (Leonardi&Pica 2013).

TFP process implies high expected costs on more productive (larger) firms ($\frac{\partial \text{Prob}(z' \leq z)}{\partial z} > 0$).

Possibly, model geared towards finding strong effects of FC on allocation of inputs across heterogeneous firms.

Calibration

Technology, preferences, depreciation parameters from literature. TFP process (η, ψ), collateral constraint (λ), firing costs (τ_l) calibrated to match:

	Data	**Model**
Targets:		
Real interest rate (%)	2	2
% firms ≤ 15	92	90
% employment in firms ≤ 15	37	44
% firms $\in [10-15]$ not growing > 15	65	66
% firm exits	11	9
Untargeted statistics:		
External funding to capital (%)	60	60
% NJD firms ≥ 30	45	50
% NJC firms ≥ 30	39	33
% entrepreneurs	11	8

Data: averages 2003-07; Inps, Istat, Bank of Italy.

Calibration

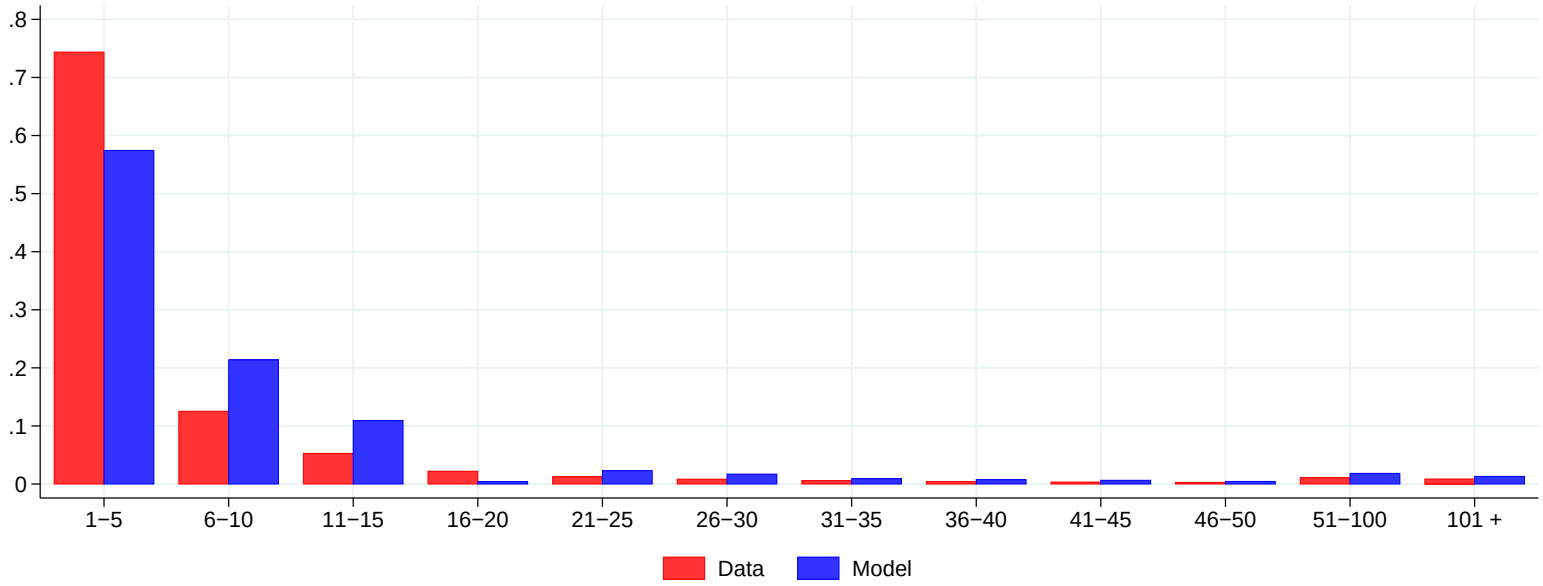
CC - Collateral constraint (λ): 4.5 times internal resources.
Buera et al (2015) use a similar model to study the unfolding of the US credit crunch and calibrate λ=7.5.

FC - Firing cost (τ_l): 7.5% annual wage bill of dismissed workers
No natural empirical counterpart or outside estimate to compare with; computed on net downward adjustment.

Calibration

BANCA D'ITALIA
EUROSISTEMA

Firm density by size.



Larger average size in M vs D, failure to replicate very small firms.
Stronger bunching just below 15 employees threshold in M vs D.

Main policy experiment

Remove size-dependent firing cost.

Main policy experiment

Remove size-dependent firing cost.
(percentage changes wrt baseline)

Empl.	Firms	Cap.	GDP	$T\bar{F}P$	Wage	Debt
0.4	-4.3	-0.9	-0.3	0.6	0.4	0.3

Main policy experiment

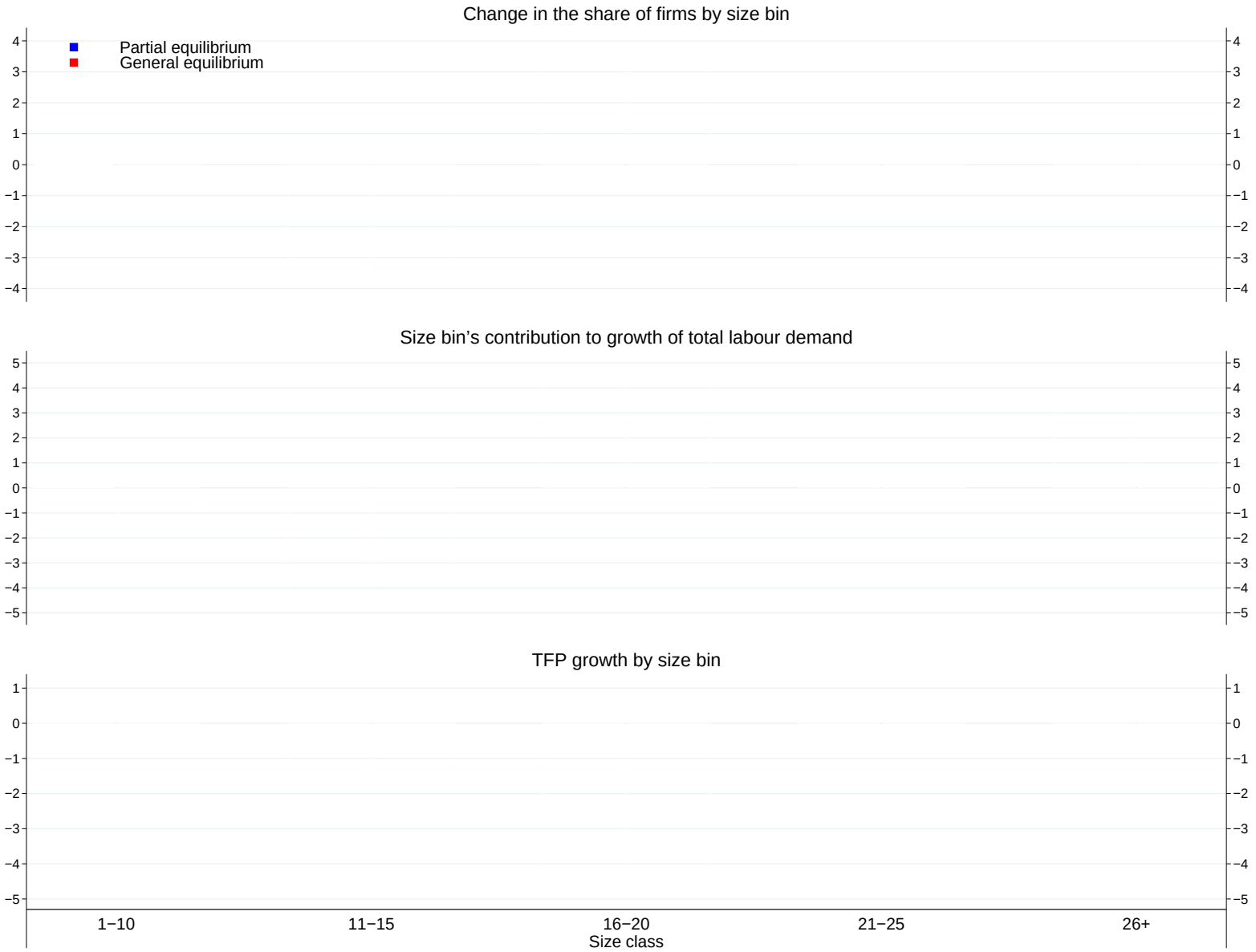
BANCA D'ITALIA
EUROSISTEMA

Remove size-dependent firing cost.
(percentage changes wrt baseline)

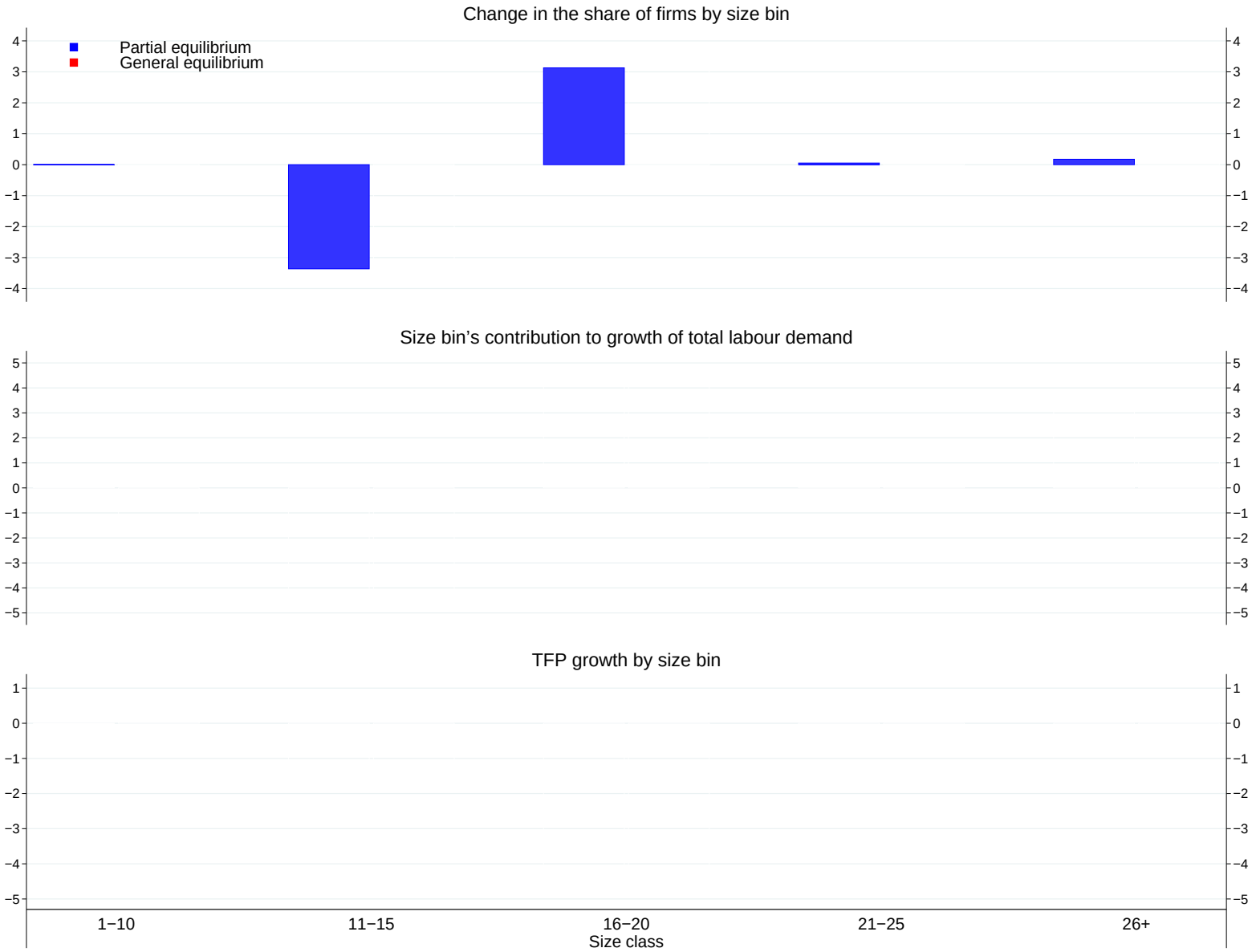
Empl.	Firms	Cap.	GDP	$T\bar{F}P$	Wage	Debt
0.4	-4.3	-0.9	-0.3	0.6	0.4	0.3

What happens along the firm size distribution?

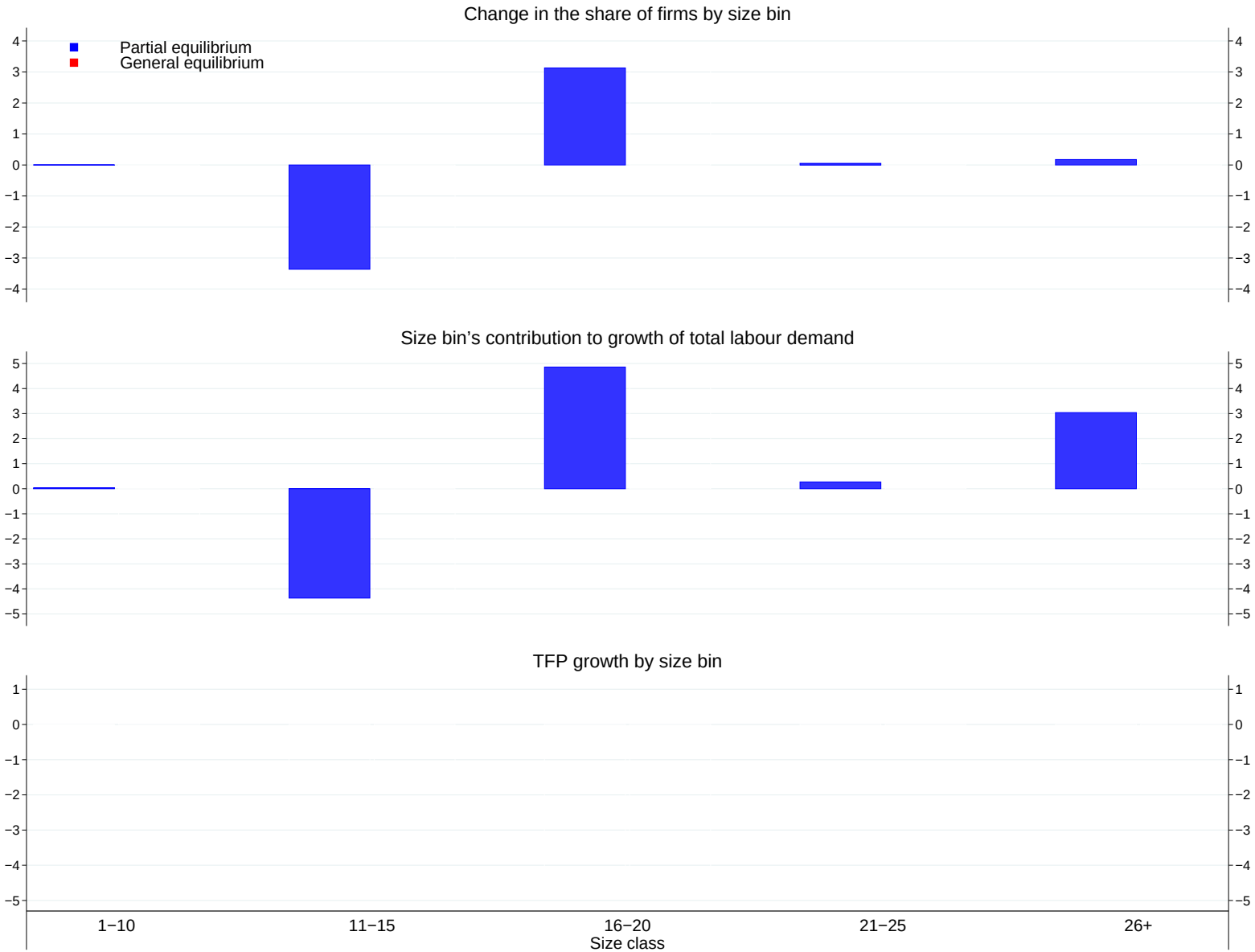
Partial and general equilibrium



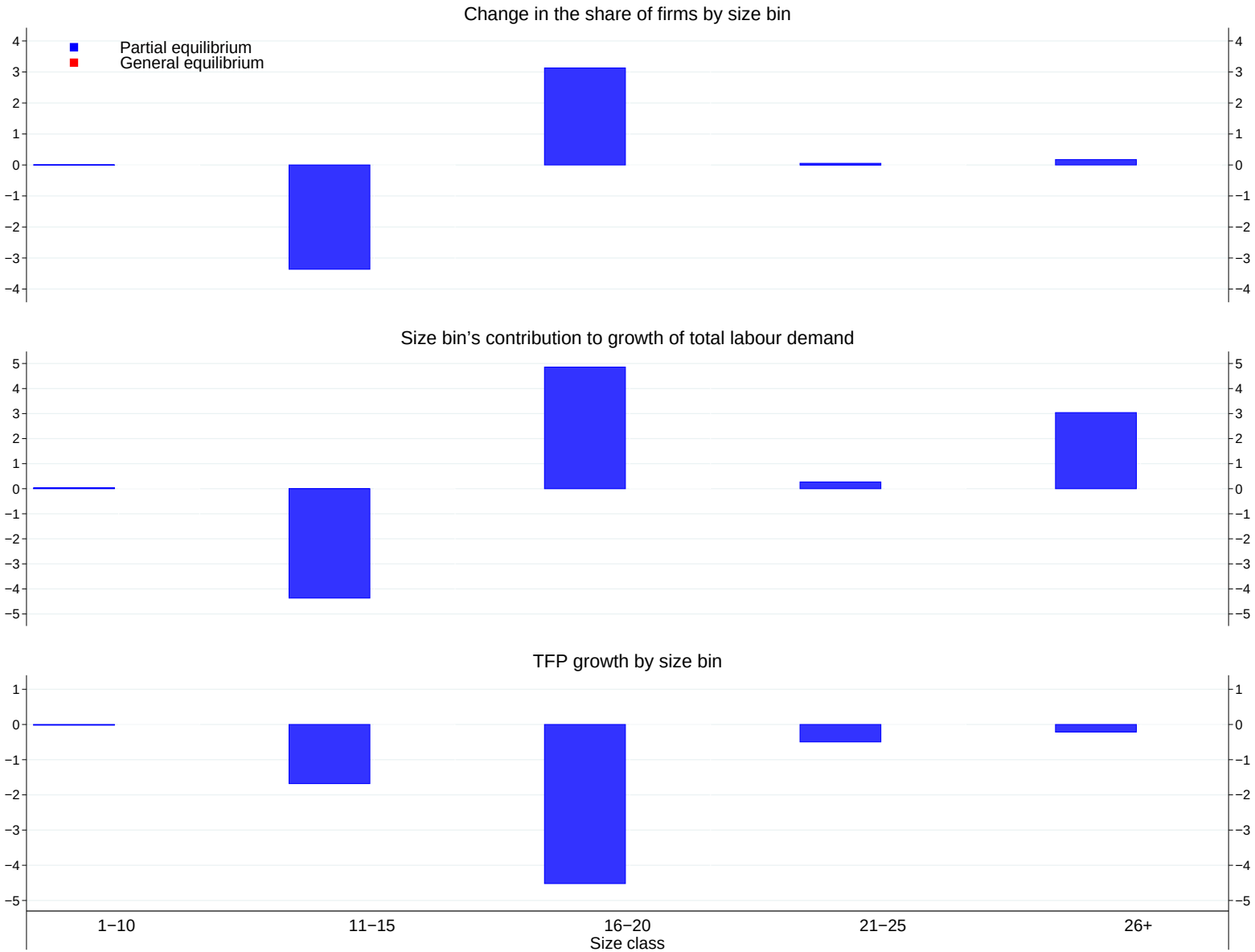
Partial and general equilibrium



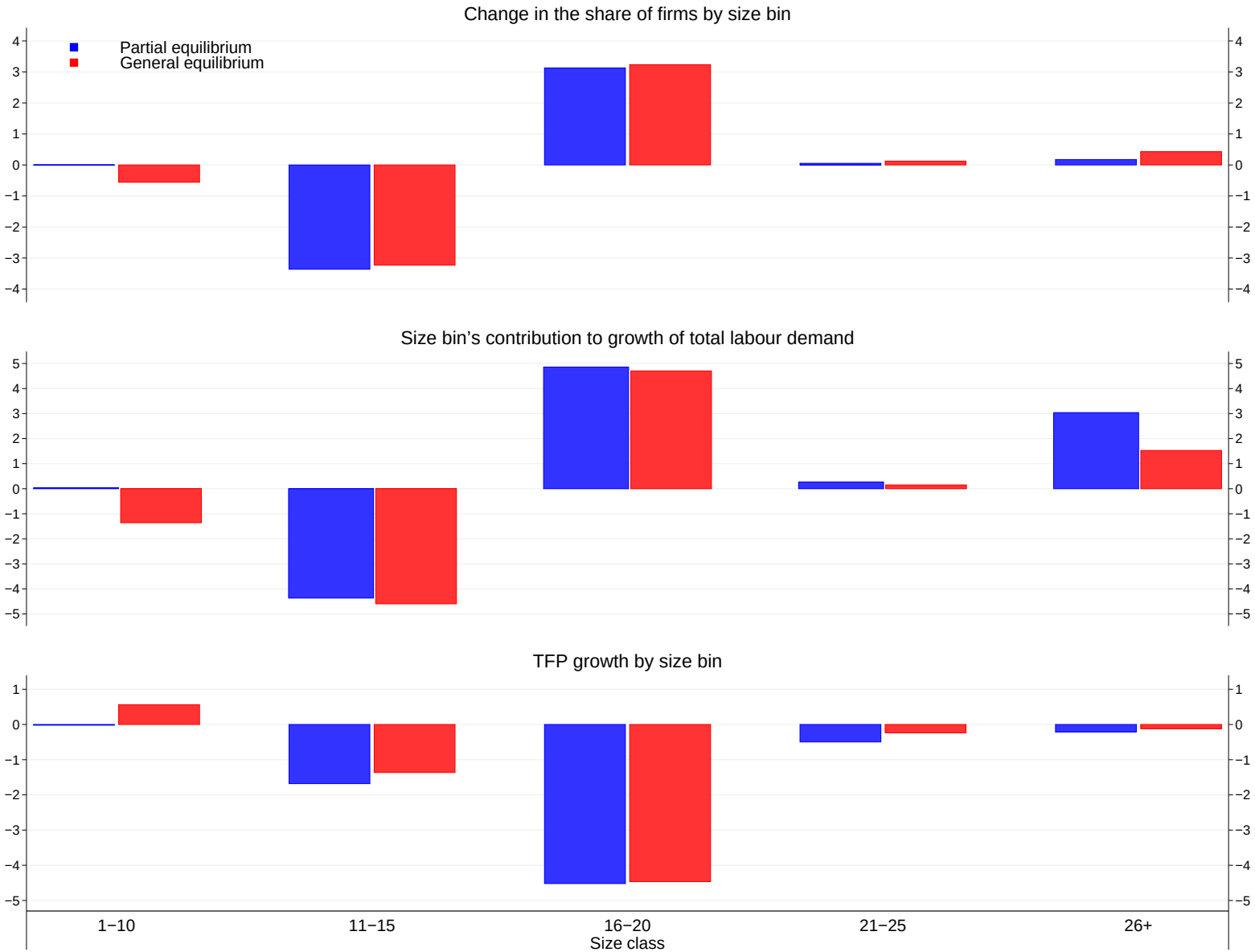
Partial and general equilibrium



Partial and general equilibrium



Partial and general equilibrium



More policy experiments - GE effects

How is GE effect of size-dependent firing costs related to the presence of financial frictions?

More policy experiments - GE effects

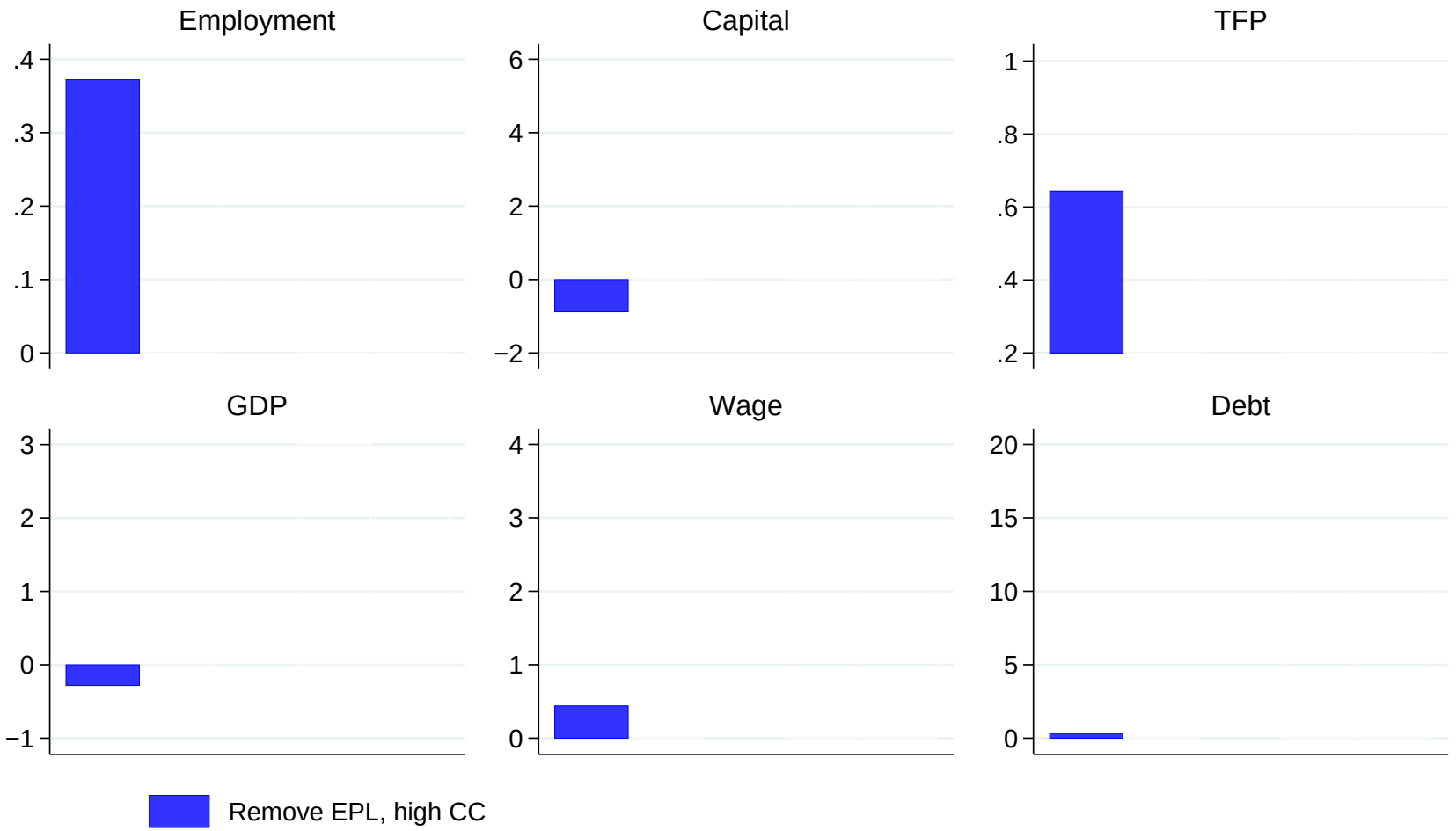
BANCA D'ITALIA
EUROSISTEMA

How is GE effect of size-dependent firing costs related to the presence of financial frictions?

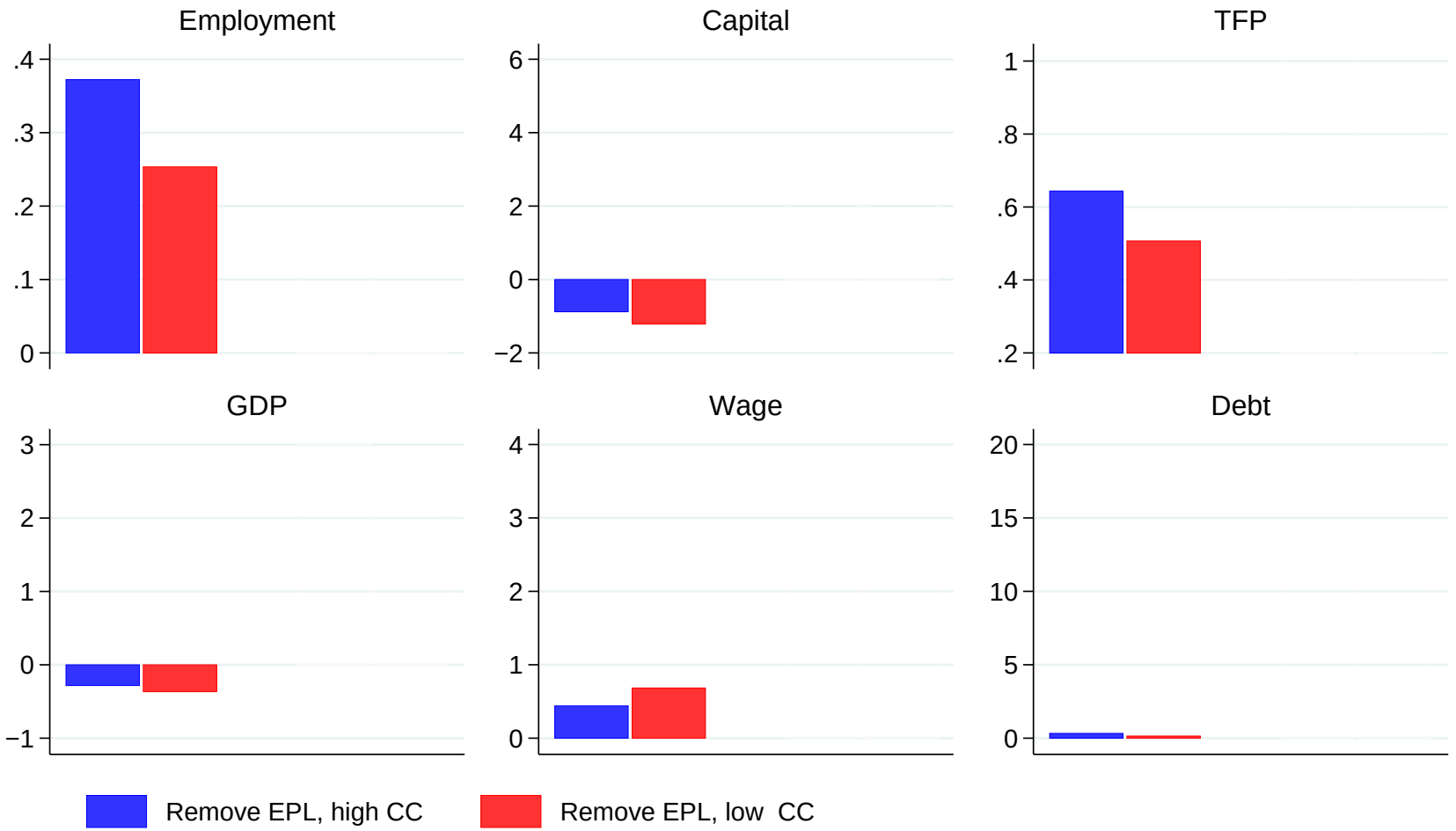
$\Rightarrow$ Does removing size-dependent EPL in a baseline scenario with weaker financial frictions generate stronger effects?

$\Rightarrow$ Do weaker financial frictions boost firm size?

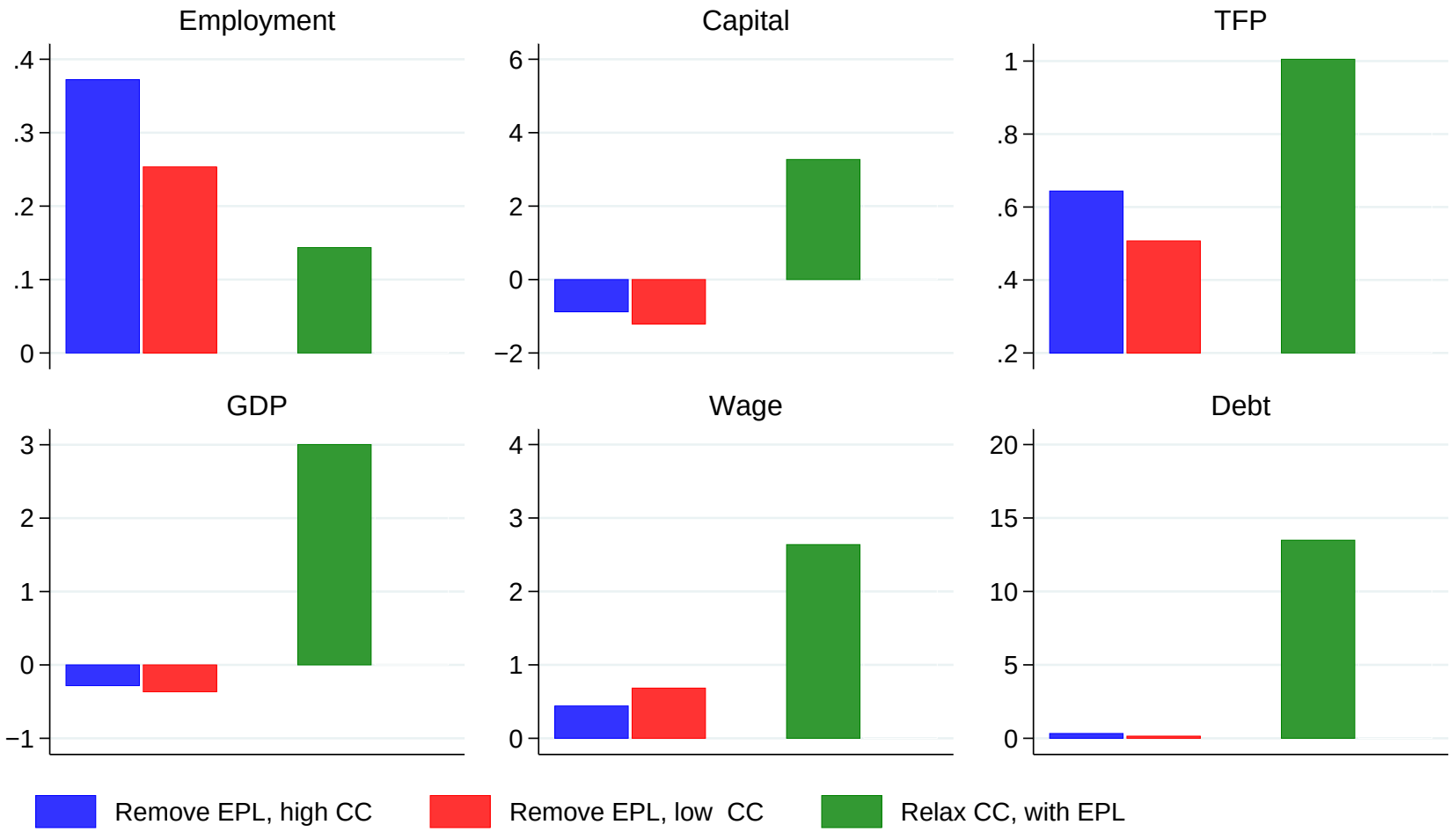
More policy experiments - GE effects



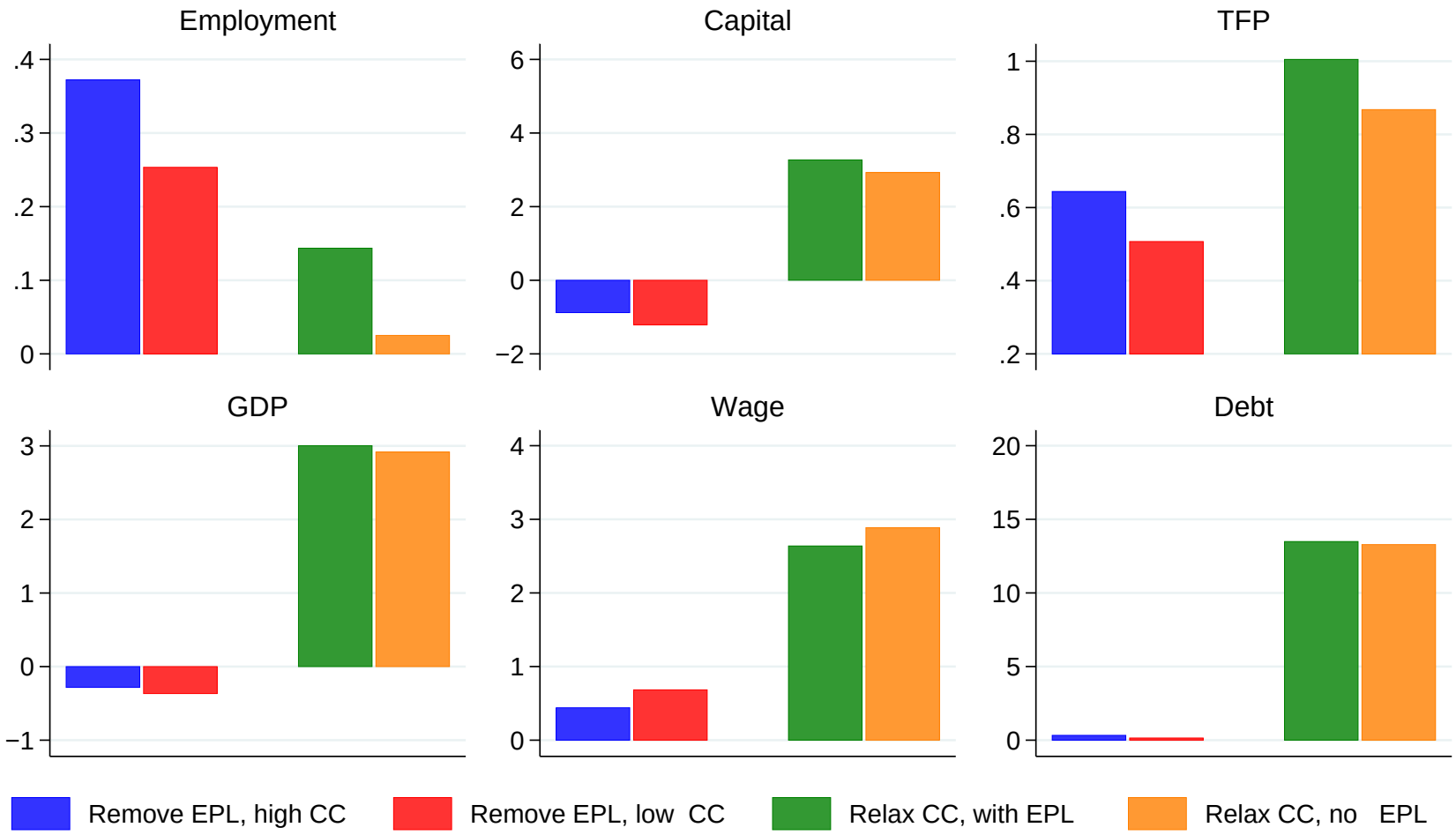
More policy experiments - GE effects



More policy experiments - GE effects



More policy experiments - GE effects



Conclusions...

Develop model of entrepreneurial choice and firm size distribution with competing size-dependent FC and CC.

Under our calibration, nearly negligible GE effects of removing FC while significant boost to output from relaxing CC to US levels even with FC.

Magnitudes depend heavily on elasticity of labour supply.

Limited effects of FC do not depend on strength of CC; limited evidence of complementarites.

Selection of pool of entrepreneurs and FC: low FC select better entrepreneurs because of higher wages.

...and to-be-dones

Role of elasticity of labour supply

External competitiveness and FC

Growth through entrepreneurial quality.

Thank you.