

Short-Term Pain for Long-Term Gain: Market Deregulation and Monetary Policy in Small Open Economies

Matteo Cacciatore ¹ Romain Duval ² Giuseppe Fiori ³
Fabio Ghironi ⁴

¹*HEC Montréal*

²*International Monetary Fund*

³*North Carolina State University*

⁴*Washington University, CEPR, and NBER*

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Motivation

- Calls for market reforms to improve economic performance have become a mantra in policy discussions.
 - ▶ ECB President Mario Draghi's speeches and press conferences over the last three years.
 - ▶ Statements of other European policymakers substantiate the point.
- Structural reforms appear to have become a crucial ingredient of the policy menu.
 - ▶ Conventional tools of demand-side macroeconomic policy are constrained.
 - ▶ Unconventional tools are being deployed without certainty of their effectiveness.

Motivation

- A large body of economic theory points to long-term gains from reforms designed to increase the flexibility of labor and product markets.
- Most of this literature provides insights into the long-term impact of such structural reforms from a static perspective.
- Much less consensus exists on the short-run effects and transition dynamics triggered by changes in product and labor market regulation.

Question

- Do market reforms imply trading short-term pain for long-term gains?
 - ▶ Major implications for the political feasibility of reforms.
- Do constraints on macroeconomic policy affect the short- and medium-term impact of reforms?
 - ▶ At the current juncture: macroeconomic policy cannot be used to smooth potential short-run costs or front-load beneficial long-run effects.
 - Zero lower bound (ZLB) on interest rates and/or monetary union membership; fiscal austerity.
 - ▶ Recent debate: does a binding ZLB exacerbate potential short-run costs of reforms? Deflationary expectations increase real interest rates?

This Paper

- Dynamic effects of labor and product market reforms.
- New Keynesian small open economy model.
- Integrate two leading frameworks developed to study product and labor market dynamics:
 - ▶ **Endogenous producers entry subject to sunk entry costs** (Bilbiie, Ghironi, and Melitz, 2012).
 - ▶ **Search-and-matching frictions, with endogenous job creation and destruction** (Mortensen and Pissarides, 1994, and den Haan, Ramey, and Watson, 2000).
- **Nominal rigidity**: monetary policy affects short-term consequences of market reforms.

Exercises

- **Product market regulation:** sunk producer entry costs (“red tape”).
- **Labor market regulation:** unemployment benefits, employment protection (worker bargaining power and firing costs), activation policies (matching efficiency).
- We consider a variety of scenarios:
 - ▶ Individual reforms vs joint deregulation in product and labor markets (policy complementarities).
 - ▶ Alternative monetary policy regimes: flexible exchange rate and currency union.

Contribution

- Address two main weaknesses of the existing literature:
 1. Structural reforms modeled in “reduced-form”: exogenous reductions in price and wage markups.
 2. Both firm and labor market (hiring-firing) dynamics are absent.
 - Cannot capture the full range of dynamic effects of structural reforms (including frictional reallocations).
- Profound implications for the behavior of inflation in response to structural reforms.

Results

1. It takes time for reforms to pay off in terms of aggregate consumption and employment (typically at least a couple of years).
 - ▶ Benefits of reforms materialize through firm entry or increased hiring, both of which are gradual processes.
 - ▶ The gains from product market reforms accrue more slowly than those from labor market reforms, although they are also typically larger.

Results

2. Joint deregulation in product and labor market is expansionary, but individual reforms entails transition costs (higher unemployment).
 - ▶ Employment protection reform initially increases layoffs more than it creates jobs.
 - ▶ Product market reform can also temporarily lead to net job destruction: incumbents downsize, and reallocation of laid-off workers takes time.
 - ▶ Joint deregulation: higher permanent income effect sustains aggregate demand + more efficient reallocation.
 - ▶ Weakening of the current account in the short run.

Results

3. Structural reforms do not have noticeable deflationary effects.

- ▶ Labor market deregulation: tighter labor market (unemployment benefits) or firing of unproductive workers (firing costs) offset the reduction in real wages, leaving real marginal costs unaffected in the short run.
- ▶ Product market deregulation: firing from incumbents increases average productivity \implies real marginal costs increases.
- ▶ **Implication:** inability of monetary policy to deliver interest rate cuts in the aftermath of reforms not an obstacle to reform implementation.
 - In contrast to the implications of exogenous price and wage markup cuts (Eggertsson, Ferrero, and Raffo, 2014, and other studies that use the same approach to modeling reforms).

Literature

- Large-scale dynamic stochastic general equilibrium: IMF's Global Economy Model; ECB's EAGLE model; European Commission's QUEST model.
- Reforms at the ZLB: Eggertsson, Ferrero, and Raffo (2014) and Villaverde et al (2013).
- Microfounded product and labor market frictions: Cacciatore and Fiori (2011), Cacciatore, Fiori, and Ghironi (2013).
 - ▶ Cacciatore, Fiori, and Ghironi (2013): optimal monetary policy response to market reform is expansionary.
 - ▶ Driven by an incentive to front-load long-run gains (not a response to sizable deflationary effects in the short run).

The Model

- Small open economy populated by a unit mass of infinitely lived, atomistic households
 - ▶ Cashless economy as in Woodford (2003).
- Some family members are unemployed, while some others are employed.
 - ▶ Perfect insurance within the household \Rightarrow no *ex post* heterogeneity across individual members (Andolfatto, 1996; Merz, 1995).
- Small-open economy assumption: Home dynamics have zero impact on rest of the world (Foreign).

Household Preferences

- Representative home household maximizes

$$E_0 \left[\sum_{t=0}^{\infty} \beta^t \frac{(C_s^H - hC_{s-1}^H)^{1-\gamma}}{1-\gamma} \right].$$

where $\beta \equiv$ discount factor and $h \equiv$ habit both lie between 0 and 1; $\gamma > 0$.

- $C_t^H \equiv$ household consumption: $C_t^H \equiv C_t + w^u(1 - L_t)$
 - ▶ $L_t \equiv$ mass of employed workers;
 - ▶ $w^u \equiv$ home production.
 - ▶ $C_t \equiv$ basket of domestic and imported consumption sub-bundles.

Household Preferences

- Consumption basket:

$$C_t \equiv \left[(1 - \alpha)^{\frac{1}{\phi}} C_{d,t}^{\frac{\phi-1}{\phi}} + \alpha^{\frac{1}{\phi}} (C_{x,t}^*)^{\frac{\phi-1}{\phi}} \right]^{\frac{\phi}{\phi-1}}, \quad \alpha \in (0, 1), \quad \phi > 0.$$

- Number of consumption goods in $C_{d,t}$ and $C_{x,t}^*$ is endogenous.
 - ▶ $C_{d,t}$ and $C_{x,t}^*$ take standard CES form: no pro-competitive effects of reforms.
 - ▶ Alternative version with translog preferences: endogenous elasticity of substitution across goods (short-run dynamics not significantly affected).

Production

- Two vertically integrated production sectors.
- **Upstream sector:** perfectly competitive firms use labor to produce a non-tradable intermediate input
 - ▶ Search and matching frictions.
- **Downstream sector:** monopolistically competitive firms purchase intermediates and produce differentiated varieties sold to consumers in both countries.
 - ▶ Endogenous product creation.
 - ▶ Downward sloping demand for Home products in the international market: the small open economy maintains the ability to affect its terms of trade.

Intermediate Goods Production

- Production is subject to both **aggregate** and **idiosyncratic shocks**: each filled job j produces $Z_t z_{jt}$ units of output, where:
 - ▶ $Z_t \equiv$ aggregate productivity, common to all firms (constant in all our exercises);
 - ▶ $z_{jt} \equiv$ *i.i.d.* draw from a time invariant distribution with cumulative distribution function $G(z)$, positive support, and density $g(z)$.

Intermediate Goods Production

- Job destruction: firm optimally destroys jobs with productivity below an endogenous threshold z_t^F .
 - ▶ Firing cost F_t (in units of C_t), proportional to the steady-state (aggregate) real wage \bar{w} .
- Job creation: firms post vacancies to hire new workers.
 - ▶ Real per-vacancy cost: κ .
 - ▶ Aggregate matching function determines probability of filling a vacancy:
 $q_t = \chi (U_t/V_t)^{1-\varepsilon}$.
 - ▶ $\chi \equiv$ matching efficiency;
 - ▶ $U_t \equiv$ mass of unemployed workers.

Intermediate Goods Production

- Law of motion of employment, l_t (those who are working at time t), in a given firm:

$$l_t = (1 - \lambda^S) \left(1 - G(z_t^F) \right) (l_{t-1} + q_{t-1}v_{t-1}).$$

- Production function:

$$y_t^I = Z_t l_t \int_{z_t^F}^{\infty} \frac{z}{1 - G(z^F)} dG(z) \equiv Z_t \bar{z}_t l_t.$$

- Firm optimally determines employment (l_t), vacancies (v_t) and job-destruction threshold (z_t^F) to maximize:

$$E_t \left\{ \sum_{s=t}^{\infty} \beta_{t,s} \left[\varphi_s Z_s \bar{z}_s l_s - \bar{w}_s l_s - \kappa v_s - G(z_t^F) (l_{s-1} + q_{s-1}v_{s-1}) F_t \right] \right\}.$$

- FOC imply standard job creation and destruction.

Intermediate Goods Production

- Job creation:

$$\frac{\kappa}{q_t} = E_t \left\{ \beta_{t,t+1} (1 - \lambda_{t+1}) [\varphi_{t+1} Z_{t+1} \bar{z}_{t+1} - \bar{w}_{t+1} + \frac{\kappa}{q_{t+1}}] \right\},$$

where $\lambda_{t+1} \equiv \lambda^S + (1 - \lambda^S)G(z_t^F)$ and $\beta_{t,t+1} \equiv \beta(u_{C,t+1}/u_{C,t})$.

- Job destruction:

$$\varphi_t Z_t z_t^F = w_t^F - F_t - \frac{\kappa}{q_t}.$$

Intermediate Goods Production

- Individual **Nash bargaining** over real wage.
- For a job with productivity z :

$$w_t(z) = \frac{\eta \left[\varphi_t Z_t z + \kappa \vartheta_t + \left(F_t - (1 - s_t) E_t \tilde{\beta}_{t,t+1} F_{t+1} \right) \right] + (1 - \eta) (b_t + w^u)}{\eta + (1 - \eta)(1 - \tau^w)}.$$

- ▶ b_t : unemployment benefit financed with lump sum taxes;
 - ▶ $\eta \in (0, 1)$: worker's bargaining power (EPL).
 - ▶ τ^w : labor income tax rate.
 - ▶ $\tilde{\beta}_{t,t+1} \equiv (1 - \lambda) \beta_{t,t+1}$.
- Introduce real wage rigidity as in Hall (2005):

$$w_{a,t}(z) \equiv \varrho w_t(z) + (1 - \varrho)w(z), \quad 0 < \varrho < 1.$$

Final Goods Production

- Continuum of symmetric monopolistically competitive producers.
 - ▶ Endogenous number of producers: N_t .
- Sunk entry cost: $f_{E,t} \equiv f_{R,t} + f_{T,t}$ in units of intermediate input.
 - ▶ $f_{R,t} \equiv$ red tape;
 - ▶ $f_{T,t} \equiv$ technological entry cost.
- Sticky prices: Rotemberg adjustment cost.
 - ▶ Producer currency pricing.
- Exogenous exit rate δ .

Final Goods Production, Continued

- Product creation:

$$\varphi_t f_{E,t} = (1 - \delta) E_t \left[\left(\frac{C_{t+1}}{C_t} \right)^{-\gamma} (\varphi_{t+1} f_{E,t+1} + d_{t+1}) \right],$$

where $d_t \equiv$ firm profit.

- Number of producers (time to build):

$$N_t = (1 - \delta)(N_{t-1} + N_{E,t-1}),$$

where $N_{E,t} \equiv$ number of entrants.

- Optimal prices:

$$\frac{p_{d,t}}{P_t} \equiv \frac{\theta}{(\theta - 1) \Xi_t} \varphi_t.$$

- ▶ Ξ_t sources of endogenous markup variation: price stickiness.

Household's Intertemporal Decisions

- Representative household can invest in two types of assets:
 - ▶ shares in mutual funds of domestic firms.
 - ▶ non-contingent domestic and foreign bonds: [incomplete international financial markets](#).
- Quadratic costs of adjusting international bond holdings.

Monetary Policy

- Benchmark scenario: **floating nominal exchange rate regime** and an interest rate reaction function:

$$1 + i_{t+1} = (1 + i_t)^{q_i} \left[(1 + i) \left(1 + \tilde{\pi}_t^{CPI} \right)^{q_\pi} \left(GDP_{R,t}^{gap} \right)^{q_Y} \right]^{1 - q_i},$$

where $\tilde{\pi}_t^{CPI} \equiv$ CPI inflation and $GDP_{R,t}^{gap} \equiv$ GDP gap.

- ▶ Data-consistent variables eliminate unmeasured variety effects from the welfare-based price index.
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- Alternative scenario: **currency union**.
 - ▶ Union-wide monetary authority sets i_{t+1}^* without responding to inflation and output dynamics of the small open economy.
 - ▶ Absent Foreign shocks, i_{t+1}^* is constant.

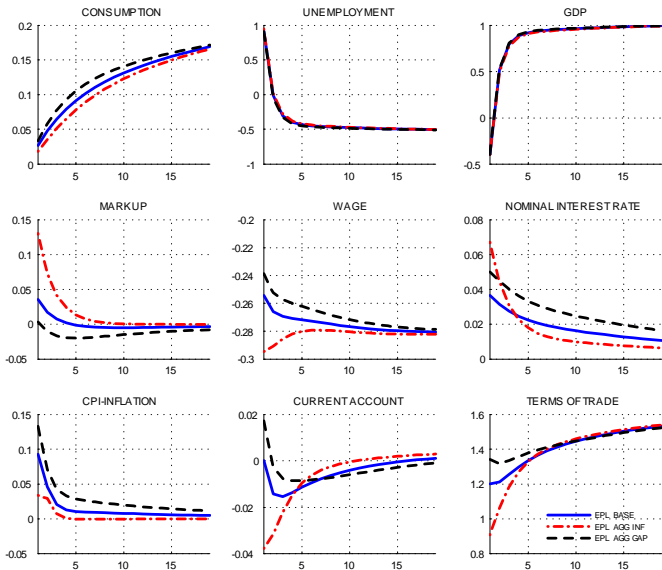
Policy Exercises

- Dynamic adjustment to the new long-run equilibrium following one-time, unanticipated, permanent change in product and labor market policy parameters.
- Four types of market reforms
 - ▶ **product market regulation**: a reduction in $f_{R,t}$;
 - ▶ **employment protection**: simultaneous reduction in F_t and η ;
 - ▶ **unemployment benefit**: a cut in b/\bar{w} (the replacement rate);
 - ▶ **activation labor market policies** (ALMPs): simultaneous increase in χ and reduction in w^u (stylized).
- Reform size: from average levels in Euro Area countries to average levels in a group of flexible (non-Euro Area) OECD countries.

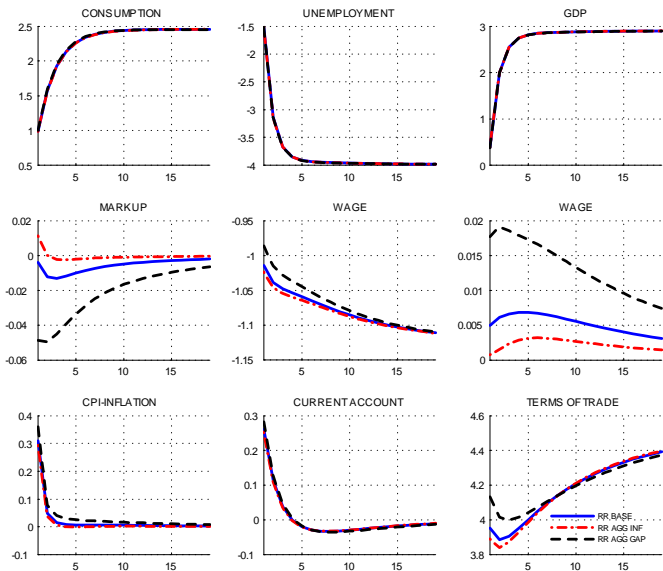
Long-Run Effects

	Unemployment (in percentage points)	Output (in %)
Decline in barriers to entry	-0.8	7.1
Relaxation of job protection	-0.5	1
Reduction in unemployment benefit replacement rate	-2.0	2.9
Strengthening of activation policy	-3.7	3.4
Reform package combining a decline in entry barriers, a reduction in the unemployment benefit replacement rate and a relaxation job protection	-5.2	10.7
Decline in barriers to entry (in “flexible” labour markets)	-0.2	6.6
Relaxation of job protection (in “flexible” product markets)	-0.5	1
Reduction in unemployment benefit replacement rate (in “flexible” product markets)	-3.4	2.4

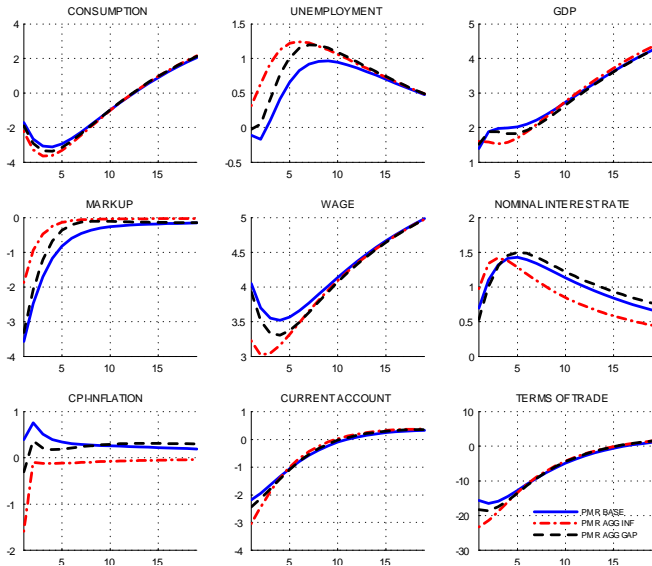
Employment Protection Deregulation



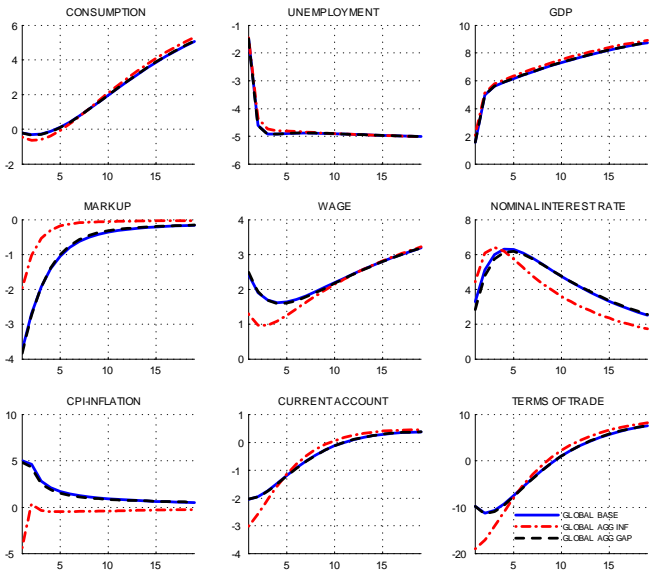
Unemployment Benefit Deregulation



Product Market Deregulation

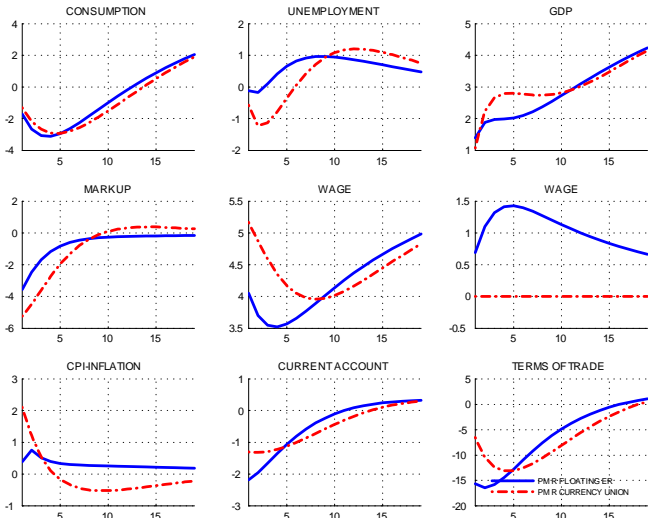


Joint Deregulation



Currency Union versus Floating Exchange Rate

Product Market Deregulation



Conclusions

- We studied the consequences of product and labor market reforms.
- New Keynesian, small open economy model with endogenous producer entry and labor market frictions.
- Benefits of reforms take time to materialize, and some reforms can entail short-run transition costs.
- Reforms do not impart significant deflationary pressure.
 - ▶ Concerns about the ZLB (or inability to use independent monetary policy in a monetary union) should not be viewed as stumbling blocks on the way to increased market flexibility.
- Ongoing work: consequences of market deregulation over the business cycle (addressing ZLB issues for large and small open economies).

Activation Policies

