ASSESSING THE MACROECONOMIC IMPACT OF STRUCTURAL REFORMS IN ITALY: THE NRP APPROACH

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Motivation: Importance of Quantifying the Impact of Structural Reforms

- An intensive reform agenda requires economic policy institutions to quantify the possible effects of single policy interventions and of complex reform scenarios
  - in April EU MS submit their plans for reforms towards *smart*, *sustainable* and *inclusive* growth (National Reform Programmes); quantitative assessment of the effects through models is explicitly required by the Commission
  - all year long to assess the effects of reform proposals
  - understanding the potential impact of structural reforms necessary for an optimal implementation of reforms themselves

Macro Impact of Structural Reforms: A Model-Based Approach

- The DGE modeling approach to economic policy modeling v. the macroeconometric approach (models used in conjunction)
- Rigidities, frictions, imperfect competition, extra costs (inefficiencies, i.e. room for improvement through reforms)
- *Ad hoc* models designed to capture specific features of the economy under study
- Examples: GEM - Global Economy Model (Bayoumi et al. 2004, Everaert, and Schule 2008); EAGLE - Euro Area and Global Economy (Gomes et al. 2013); IdEA - Italian and Euro area Economy Model (Forni et al. 2010); QUEST III (Roeger et al. 2009); GIMF - Global Integrated Monetary and Fiscal model (e.g. Lusinyan and Muir 2013); NAWM - New Area-Wide Model (Coenen et al. 2008)

Tools of Analysis

- DGE models at the Italian Department of Treasury (used in conjunction with the Italian Treasury Econometric Model - ITEM)
  - QUEST III with R&D adapted to Italy (Roeger et al. 2009; D'Auria et al. 2009)
  - IGEM - Italian General Equilibrium Model (Annicchiarico et al. 2013)

Tools of Analysis

QUEST III with R&D - Italy

- This model embodies endogenous growth in the spirit of Romer (1990) and Jones (1995, 2005)
- Suitable to study the impact of structural reforms according to Europe 2020 strategy:
  - R&D sector $\Longrightarrow$ smart growth
  - imperfectly competitive product markets, entry and administrative burden costs $\Longrightarrow$ internal market
  - imperfectly competitive labour markets, benefit replacement rates, labour taxes $\Longrightarrow$ inclusive growth

Tools of Analysis

QUEST III with R&D - Italy

- Country-specific features of Italian version wrt EU version:
  - high (low) share of low (high) skilled workers
  - high share of LC households
  - lower employment rate
  - high fixed entry costs
  - poor R&D intensity and low contribution of R&D labour to knowledge creation
  - heavy taxation on labour income and a high share of transfers as a percentage of GDP

Tools of Analysis

IGEM

- Why a new model at the Department of Treasury?
- *Ad hoc* model designed to capture specific features of the Italian economy
- Many fiscal instruments and modular approach
- This version focuses on the dualism of the Italian labour market
- The resulting model as a compromise between theoretical consistency and the needs of the Department of Treasury

Tools of Analysis

IGEM - Labour Market Structure

- Try to capture the dualism
  - primary sector with higher protection, better working conditions, superior opportunities for promotion, higher pays
  - secondary sector with poor protection, limited promotion opportunities, lower pays
- Three different categories of workers:
  - (i) employees (skilled and unskilled) with stable contract of employment and strong protection (differentiated labour inputs)
  - (ii) self-employed workers and professionals who supply work under contracts for services (differentiated labour inputs)
  - (iii) atypical workers with flexible working patterns and weak employment protection

Tools of Analysis

IGEM - Labour Market Structure

	Market Power	Wage Rigidities	Adjust. Cost on labour
Employees	yes	yes, high	yes, high
Self-Employed	yes	yes, low	yes, low
Atypical	no	no	yes, low

- Monopolistic trade unions set wages of skilled and unskilled subordinate workers
- Self-employed and professionals work on their own under the tutelage of professional orders (or registers)
- Implications:
  - atypical as the more volatile component of the workforce
  - large set of labour-market related fiscal instruments

Tools of Analysis

IGEM - Households

- A continuum of households $[0, 1]$. Households heterogeneity related to that of labour markets
  - Ricardian households work as employees and as self-employed workers
  - non-Ricardian households work as atypical workers and as unskilled employees
  - Rationale: workers with stable contracts have an easy access to credit; atypical workers with flexible labour patterns are more likely to be liquidity constrained
- $1 - s_{NR}$ (s_{NR}) the fraction of (non-) Ricardian households

s_{N_A}, s_{N_S}, s_{L_L}, s_{L_H} as population shares of atypical workers, self-employed workers, unskilled and skilled employees, hence

$$s_{NR} = s_{N_A} + \lambda_{L_L} s_{L_L},$$

$$1 - s_{NR} = s_{N_S} + s_{L_H} + (1 - \lambda_{L_L}) s_{L_L},$$

- λ_{L_L} the share of unskilled labour inputs supplied by non-Ricardian households (baseline $\lambda_{L_L} = 0$)

Structural Reforms and Model-Based Evaluation

Problems

- Model-based evaluation of structural reforms presents an input assessment problem
- Mapping of policy interventions is not (always) obvious and theory and/or judgement are needed
- Five-step procedure:
  1. Model choice (tool problem)
  2. Map indicators onto the model (mapping problem)
  3. Need a quantitative indicator of each reform effort (size problem)
  4. Timing of implementation (timing problem)
  5. Simulate the model (computational problem)

Model-Based Evaluation: Tool & Mapping Problems

1. Choice of the appropriate tool
2. Map indicators onto the model
   - evaluate the feasibility of the simulation given the chosen tool
   - establish how the reform is assumed to impact on exogenous variables and parameter values of the model

Model-Based Evaluation: Size Problem

3. Need a quantitative indicator of each reform effort and decide the size
   - reduce the gap with best performers
   - best practice among reforming countries
   - past experience and empirical evidence
   - economic theory

Model-Based Evaluation: Timing Problem

4. Timing problem. Simulations under the assumption that all changes are implemented:
   - *immediately*: the economy is initially in steady state and the reform plan is immediately and fully implemented (Big-Bang hypothesis)
   - *gradually*: the economy is initially in steady state, the reform plan is announced and starts to be implemented phasing in gradually (gradual hypothesis)
   - lack of credibility can also be considered (e.g. "doubting Thomas" scenarios....)

Model-Based Evaluation: Computational Problem

5. Computational problem:
   - Analyzing the effects of a permanent shock requires solving a two-point boundary-problem (i.e. initial conditions for predetermined variables and terminal conditions for forward looking variables)
     - terminal conditions computed by moving the calibration in steps (taxing if considering complex reform scenarios)
     - reformulate the problem so that terminal conditions are invariant to policy changes (see Roeger and in't Veld 1999)
   - Stability/convergence
   - Control the feedback of rules (e.g. fiscal rule usually switched off when considering fiscal consolidation)

Reform Scenarios in the NRP 2012

- Quantifying the impact of product market reforms aimed at
  - improving competition in product markets - liberalization (Law 27/2012)
  - improving the efficiency of PA services and reduction of administrative burden - simplification (Law 35/2012)

Quantifying the Impact of Product Market Reforms in the NRP 2012

Model Choice and Mapping

- Model choice: QUEST III with R&D
- Channels used to evaluate the effects of competition-enhancing policy:
  - Price markups (measure of the degree of competition)
  - Entry costs (measure of regulatory burden and of limitations on starting new business)
  - Administrative burden (time spent with bureaucracy - overhead labour)

Quantifying the Impact of Product Market Reforms in the NRP 2012

Mapping

The economic logic of the implementation:

$$\text{Markup}=\text{F}(\text{number\_of\_firms})$$

- if number of firms$\uparrow \Longrightarrow$ markup $\downarrow$
- if fixed entry-costs$\downarrow$ number for firms$\uparrow \Longrightarrow$ markup $\downarrow$
- If administrative burden$\downarrow$ number of firms$\uparrow \Longrightarrow$ markup $\downarrow$

The correct model should embed endogenous markups, but standard DGE models have exogenous markups (i.e. monopolistic competition *à la* Dixit-Stiglitz).

Quantifying the Impact of Product Market Reforms in the NRP 2012

Mapping

- Need a quantitative indicator of each reform effort and decide the size
- Adopted strategy:
  - Set exogenously the changes in the fixed costs
  - Set exogenously the changes in the overhead labour (administrative burden indicator)
  - Link the changes of the price markup to the changes in the fixed costs and in the overhead labour.
- Two problems remain:
  - What the size of each exogenously set changes?
  - How to relate the changes in the markup to changes in the overhead labour and in the fixed costs?

Quantifying the Impact of Product Market Reforms in the NRP 2012

Size

- Possible solution: use historical experience as a guide
- Implicit assumption: the implementation of current reforms may yield substantial benefits in terms of fostering competition as those experienced across Europe as a result of the wave of product market reforms undertaken over the late 1980s and 1990s.
- The sizes of shocks to relevant policy variables (markups, entry costs and overhead labour) have been chosen on the basis of the progress made in these areas of interventions across EU countries over the period 1986-2000, as estimated by Griffith and Harrison (2004), accounting for the impact that different reforms may have on competition.

Quantifying the Impact of Product Market Reforms in the NRP 2012

Size

Griffith and Harrison (2004) consider a relationship between the product market reforms and the markup:

$$\text{Markup} = a1 \times (\text{fixed entry costs indicator}) + a2 \times (\text{administrative burden indicator}) + a3 \times (\text{other variables})$$

Quantifying the Impact of Product Market Reforms in the NRP 2012

Size

- Fixed entry costs «ease of starting a new business»
- Administrative burden «time spent with government bureaucracy»
- Fraser Institute, Index of Economic Freedom (2003), Global Competitiveness Report (survey on the business perception of regulation)
- NB: An increase in these indexes implies an improvement (range: 1-10); coverage of these indicators consistent with the period in which the wave of reforms took place in Italy; indexes strongly correlated to OECD indicators.

	1995	2000	Δ
ease of starting a new business	4.1	5.1	1
time spent with gov. bureaucracy	4.7	6.1	1.4

Quantifying the Impact of Product Market Reforms in the NRP 2012

Size

- Response of the markup to variation in the fixed entry costs (parameter a1)=-0.021
- Response of the markup to variation in the admin burden (parameter a2)=-0.01
- Period 1995 - 2000:

$$\Delta\text{index 'ease of starting new business'} = 1$$
$$\Delta \text{ index 'time spent with government bureaucracy'} = 1.4$$

Given Griffith and Harrison (2004, Table 9) estimates for a1, a2:

$$\Delta\text{markup} = (-0.021 \times 1 - 0.01 \times 1.4) \times q = -1.8 \text{ pp } (q=0.5)$$

Quantifying the Impact of Product Market Reforms in the NRP 2012

Size

- N.B: q (=0.5) is the weight associated to variables changes to avoid inserting the policy changes twice into the model.
- Taking stock, the variations of the relevant variables of the model:
  - Price markup: -1.8 pp
  - Fixed entry cost: -12% =- [(1-q)×(1/4.1)] %
  - Admin burden-overhead labour: -15%= -[(1-q) ×(1.4/4.7)]%

Quantifying the Impact of Product Market Reforms in the NRP 2012

Timing

- Fully credible policy reform plan
- Degree of gradualism: 10 years
- Starting from 2012

Quantifying the Impact of Product Market Reforms in the NRP 2012

Results

TABLE II.13: OVERALL MACROECONOMIC EFFECTS OF DECREE LAW 1/2012 (CVT. INTO LAW 27/2012) AND DECREE LAW 5/2012 (CVT. INTO LAW 35/2012) (in % points of difference with respect to base simulation)

	2012	2013	2014	2015	2020
GDP	0.2	0.4	0.7	0.9	2.4
Consumption	0.1	0.1	0.2	0.3	1.1
Investment	0.5	1.1	1.6	2.0	3.9
Employment	0.2	0.2	0.2	0.1	0.1

Source: QUEST III – Italy (European Commission).

Quantifying the Impact of Product Market Reforms in the NRP 2012

Results

TABLE II.14: MACROECONOMIC EFFECTS OF SINGLE MEASURES OF DECREE LAW 1/2012 (CVT. LAW 27/2012) AND DECREE LAW 5/2012 (CVT. LAW 35/2012) (in % points of difference with respect to base simulation)

ID (*) LD 1/2012	ID (*) LD 5/2012	Measure	Description		2012	2013	2014	2015	2020
32, 40, 45, 48, 49, 94, 96, 99, 102, 103	125	Measures to promote competition and market openness	Reduction of mark-up	GDP	0.0	0.1	0.3	0.4	1.2
				Consumption	-0.6	-1.0	-1.0	-0.9	-0.5
				Investment	0.7	1.5	2.1	2.6	4.2
				Employment	0.0	0.0	0.0	0.1	0.3
39, 95, 100, 101, 105, 154, 159	26, 116, 118, 119	Reduction of limitations to entrepreneurial activities, improvement of business environment, administrative simplification	Reduction of entry barriers	GDP	0.1	0.2	0.2	0.3	0.7
				Consumption	0.4	0.7	0.7	0.8	1.0
				Investment	-0.2	-0.4	-0.5	-0.6	-0.5
				Employment	0.1	0.1	0.1	0.0	-0.1
27, 34, 41, 92, 93, 96, 97	41, 44, 116, 117, 123, 124, 125	Reduction of administrative burden, administrative simplification	Reduction of time spent on bureaucracy	GDP	0.1	0.1	0.2	0.2	0.5
				Consumption	0.3	0.4	0.4	0.5	0.6
				Investment	0.0	0.0	0.0	0.0	0.2
				Employment	0.1	0.1	0.1	0.0	-0.1

Source: QUEST III - Italy (European Commission).
(*) The numbers in the ID column correspond to the measures included in table II.11.

Quantifying the Impact of Product Market Reforms in the NRP 2012

Results under a Closing Gap Assumption wrt 3 Best Performers

TABLE II.16: OVERALL MACROECONOMIC EFFECTS OF STRUCTURAL REFORMS TO CLOSE THE GAP WITH EUROPE'S BEST PERFORMERS (in % points of difference with base simulation)

	2012	2013	2014	2015	2020
GDP	0.5	0.9	1.3	1.9	5.0
Consumption	0.4	0.7	1.0	1.3	3.2
Investment	0.6	1.3	2.0	2.7	6.1
Employment	0.4	0.5	0.4	0.4	0.3

Source: QUEST III - Italy (European Commission).

Reform Scenarios in the NRP 2013

- Quantifying the impact of labour market reforms (Law 92/2012) aimed at
  - stabilizing employment relationships and transition towards full-time employment contracts without expiration dates (i.e. permanent workers)
  - increasing employment through active labour policy measures, various measures pro flexibility in hiring and dismissal
- Quantifying the impact of initiatives relaunching growth and efficiency of the economy through:
  - initiatives aimed at facilitating access to credit for firms (Law no. 134/2012)
  - initiatives aimed at making PA more efficient and at facilitating access of individuals and businesses to administrative procedures (Law no. 221/2012.)

Quantifying the Impact of Labour Market Reforms in the NRP 2013

Model Choice and Mapping

- Model choice: IGEM
- Channels used to evaluate the impact of labour market reforms:
  - Wage markups (mapping the effects of growing flexibility of the labour market along with policies pro weak segments of the workforce)
  - Rates of social security contributions (employer portion increase)
  - Ratio of temporary workers to total workers

Quantifying the Impact of Labour Market Reforms in the NRP 2013

Size and Timing

- Wage markups change on the basis of empirical findings by Arpaia and Mourre (2012): Δmarkup= -14pp over 10 years (but also for Δmarkup= -7pp, Δmarkup= -21pp)
- Employer portion of SSC as established by law (over 5 years):
  - +7pp for project workers
  - +1.4pp for fixed-term-contract workers
  - +1.3pp for apprentices
  - Weighted average increase of 1.9pp mapped into IGEM

Quantifying the Impact of Labour Market Reforms in the NRP 2013

Size and Timing

- Change in the ratio of temporary workers to total workers
  - Endogenous hypothesis (-Δ0.5pp over three years):
    - two-stage procedure: (i) impart the first 2 interventions into IGEM and observe the increase in hours worked overall and long-run change in the distribution of hours across households (greater use of permanent work contracts, worked hours fall for LC); (ii) compute change in the ratio temporary workers / total workers to re-establish the initial distribution of hours.
  - Statistical hypothesis (-Δ2.5pp over three years):
    - from micro-data on labour force survey, assuming a fall in the ratio of temporary workers equal to the increase observed 2004-2012
  - Theoretical hypothesis (-Δ7pp over three years):
    - change considered 'optimal' for Italian firms by empirical analysis (Caggese and Cuñat 2008)

Quantifying the Impact of Labour Market Reforms in the NRP 2013

5 Scenarios

TABLE II.5: ASSUMPTIONS OF REFORM SCENARIOS IN IGEM AND THE MAGNITUDE OF CHANGES

Change	IGEM Variable	Assumptions				
		1	2	3	4	5
Reduction of the portion of the temporary workers with respect to permanent workers	Shift in percentages	0.5 p.p.	2.5 p.p.	7.0 p.p.	2.5 p.p.	
Reduction of the wage mark-up of permanent workers	Wage mark-up	14.0 p.p.			7.0 p.p.	21 p.p.
Increase weighted average rate of social-welfare contributions for temporary workers (workers with fixed-term contracts, project workers and apprentices)	Social-welfare contributions for temporary employees	1.9 p.p.				

Source: MEF analyses with the IGEM model.

Quantifying the Impact of Labour Market Reforms in the NRP 2013

Results

TABLE II.6: EFFECTS OF LABOUR MARKET REFORM (AVERAGE PERCENTAGE SHIFTS WITH RESPECT TO BASELINE simulation)

	2015	2020	Long term
GDP	0.2 - 0.6	0.5 - 1.7	0.8 - 2.5
Consumption	0.5 - 1.8	0.7 - 2.0	1.1 - 3.1
Investments	-0.3 - 0.0	0.2 - 1.4	0.7 - 2.1
Employment	-0.2 - 0.1	0.6 - 1.4	0.8 - 1.9

Source: MEF analyses with the IGEM model.

Quantifying the Impact of Initiatives Relaunching Growth and Efficiency in the NRP 2013

Model Choice and Mapping

- Model choice: QUEST III with R&D + ITEM
- Channels used to evaluate the impact of pro-growth initiatives:
  - facilitating access to credit for firms: credit risk on tangible and intangible capital
  - making the PA more efficient: overhead labour costs

Quantifying the Impact of Initiatives Relaunching Growth and Efficiency in the NRP 2013

Size and Timing

- Credit risk on tangible and intangible capital
  - Endogenous hypothesis (-Δ10 basis points over 7 years):
    - two-stage procedure: (i) estimate with ITEM the impact of the reduction in the user's cost of capital given the amount of resources allocated and observe the corresponding variation in the rental rate; (ii) impart this change in QUEST III by reducing the risk premium on capital.
- Change in overhead labour costs (-Δ9.8% over 5 years):
  - Empirical evidence: EC's estimates of possible savings in relation to the EU's introduction of e-admin procedures (EC 2006)

Quantifying the Impact of Initiatives Relaunching Growth and Efficiency in the NRP 2013

Results

TABLE II.4: MACROECONOMIC EFFECTS of the 'growth' DECREES (PERCENTAGE CHANGES WITH RESPECT TO THE BASELINE simulation)

	2015	2020	Long term
GDP	0.3	0.5	0.7
Consumption	0.4	0.5	0.5
Investments	0.6	0.5	0.6

Source: Analyses using ITEM and QUEST III - Italy (European Commission).

Total Impact on Output

Results

TABLE II.7: MACROECONOMIC EFFECTS of the 2012 REFORMS (GDP - AVERAGE PERCENTAGE SHIFTS WITH RESPECT TO BASELINE simulation)

	2015	2020	Long term
Deregulation and simplification	0.9	2.4	4.8
Growth Decrees 1 and 2	0.3	0.5	0.7
Labour reform	0.4	1.0	1.4
Total	1.6	3.9	6.9

Source: MEF analyses using the ITEM, QUEST III - Italy (European Commission) and IGEM models.

Evaluation of Italy's reforms by OECD and IMF

- OECD (2012, 2013)
  - using updates of the PMR & EPL indexes the potential impact on GDP up to 4-5.5 per cent in 10 years
- IMF (Lusinyan & Muir 2013)
  - labour and product market reforms package may generate GDP growth up to 5.7 per cent in 5 years and 10.5 per cent in the long term.

Caveats

- Quantifying the impact of structural reforms is an extremely difficult and delicate exercise
- All results generated through models constrained by tight theoretical assumptions
- Simulation results should be interpreted in the light of model's structure

Further Complications

- *Time lags* in reforms implementation, cross-country spillovers and complementarities, trade-offs between reforms in different domains
- Effects of *short-term economic fluctuations* make it difficult to disentangle the effects of reforms undertaken from others determinants
- *Credit crunch* problems and *fiscal consolidation* measures may hinder and/or delay the beneficial effects of reforms
- *Credibility* of reforms programme
- *Political economy interactions* (e.g. more competition in product markets generates support for labour market deregulation)

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