# Flexible employment, job flows and labour productivity

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# Motivations

- In a country with rigid EPL (Italy), labour market flexibility has been pursued by promoting the use of temporary contracts. Over the past decade several reforms aimed at favouring the use of temporary contracts by firms.

- This resulted not only in changes on existing types of temp. contracts (fixed-terms and apprenticeships) but also in the introduction of new forms (agency workers, collaboration contracts).

- However previous research has ignored the role played by substitutabiity between the various types of temporary employment in Italy when evaluating its allocative impacts

## Motivations

- Reforming one type of contract may have little or no real effect if firms substitute across types of temporary labour, or between permament and temporary contracts

- The actual way in which some reforms were implemented (i.e. via sector-by-sector approval through the rounds of collective bargaining) may blur their intended effects

- In this paper we consider these neglected aspects and show that reforms effect on productivity and other firm outcomes may go in the unexpected direction.

# This paper

- Exploits exogenous variation in the exposure of firms to institutional changes: Reform of apprenticeship contracts and reform of fixed term contracts

- Uses firm level panel data to investigate the impact of institutional changes on job flows and labour productivity and K/L

- Uses detailed information on all types of temporary employment used by the firm to analyse substitution across contracts

# Preview of results

- We find that the reform of apprenticeships has been successful in increasing job flows and labour productivity. And decreasing I/L and K/L

- We find that the reform of fixed term contracts does not seem to have had the intended results. Job flows and productivity are reduced in those firms affected and K/L increased.

- Substitution across types of (temporary) contracts is one explanation: we estimate high ε of substitution between contracts

# Outline of talk

- Institutional background
- Literature review
- Models and estimation
- Data
- Results
- Conclusion

# Institutional background: temporary employment in Italy

- A wide menu of temporary contracts is available to italian firms: fixed term, apprenticeships, agency workers, collaborators
- Reforms of temporary employment contracts:
  - the "Treu-Package" (1997) legalised temporary work agencies and liberalised both apprenticeship and fixed-term contracts;
  - Decree-Law No. 368 (2001) which eased restrictions on **fixed-term contracts** further;
  - the "Biagi Law" (2003) introduced a number of new contracts to the legislation designed to make it easier to employ workers on a temporary basis. New and more flexible forms of **apprenticeships** were also included in this new law.
- We focus on reforms 2 and 3

# Institutional background (1): Fixed-terms (Legislative Decree No. 368/2001 )

- Liberalised the contract abolishing the detailed list of specific reasons (*causali*) and introducing the following single general reason (the so-called "causalone")
  - Pros: removed the need of finding specific reasons
  - Cons: introduced uncertainty on applicability
  - Labour law experts dubious about its cost-reducing impact due
- Abolished the possibility that unions introduced additional causali in sectoral contracts. Unions could still set quotas for temporary contracts in collective bargaining rounds

- For the decree to become effective, parties agreement in collective bargaining rounds about the specific implementation of the general provisions were required. But only some sectors, and not others, had collective bargaining rounds
- This determines variation by sectors and over time in firms exposure to the new conditions for fixed-terms, which we exploit in estimation.

# Institutional background (2): Apprenticeships (Law 30/2003)

- Apprenticeships have a long tradition in Italy. The law meant to incentivate their utilisation by:
  - Abolishing the need of certifying qualifications obtained by the employee
  - Extending the upper age limit for applicability from 25 to 30
  - Introducing the option to perform training at the workplace rather than externally.
- However, before the new law could be implemented, it required sets of regulations to be issued by the regions.
- Only some regions and not others issued the necessary regulations
- In some cases, regulations were experimental and only affected some sectors.
- All this generates variation over time across regions and (in few cases) sectors in the possibility of firms to utilise the new apprenticeships, which we exploit in estimation.

# Percentage of workers (firms data) affected by reforms

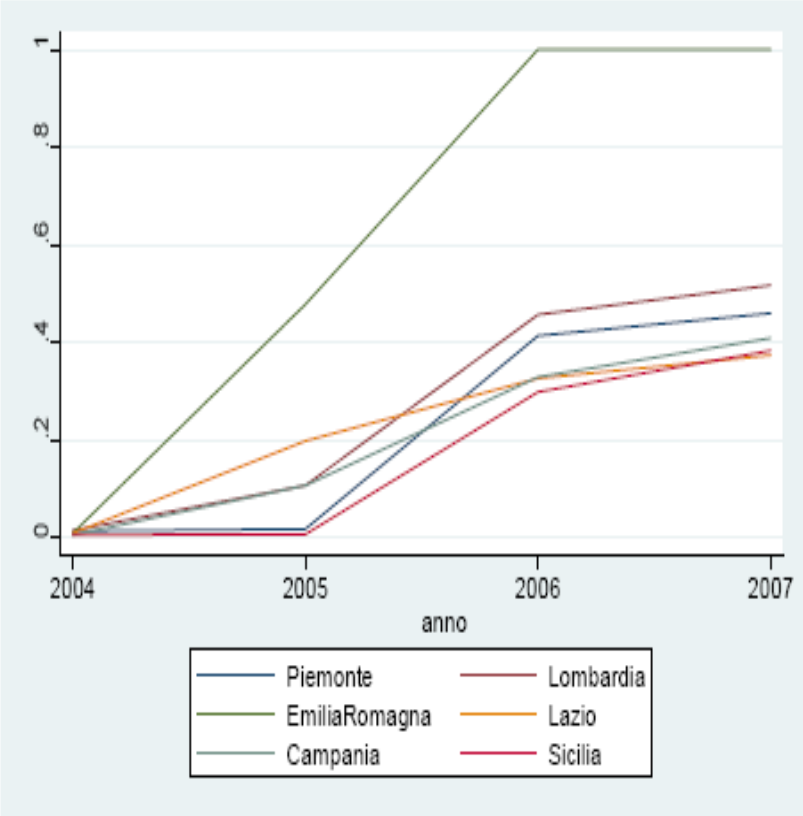


Figure 3: Share of workers affected by the reform of apprendistato contracts

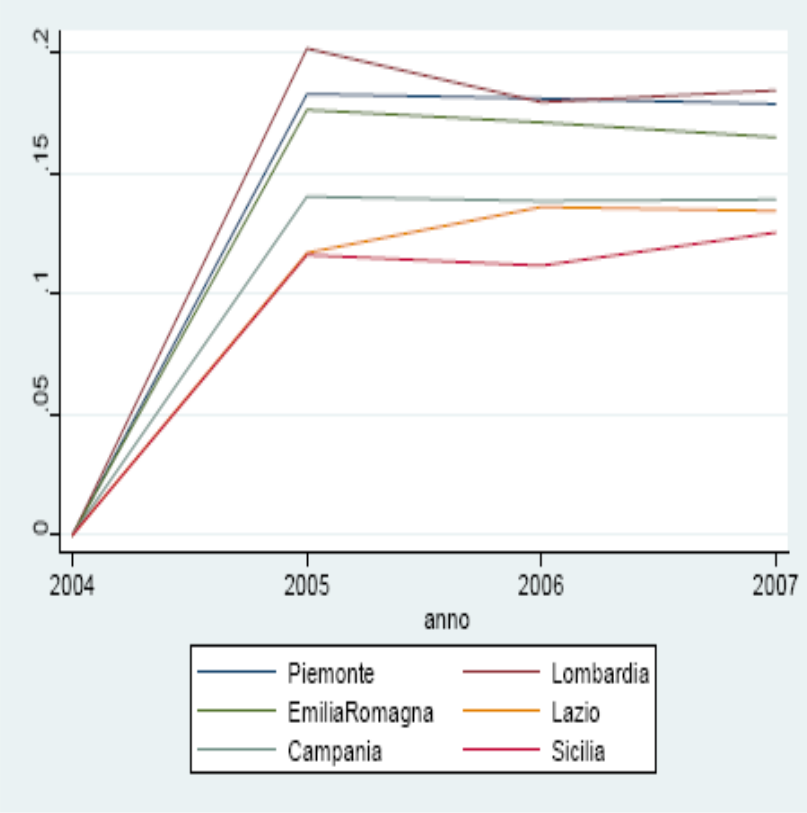


Figure 4: Share of workers affected by the Biagi reform on fixed-term contracts

# Previous studies

- The research on temporary contracts and layoff cost has shown how existing quantitative results on employment and productivity depend crucially on different modelling choices (Ljungqvist, 2002).
- These models conclude that fixed-term contracts are used as buffer-stock and boost the number of hirings and firings in the economy while the variation of aggregate employment remains ambiguous. [Aguirregabiria and Alonso-Borrego (1999), Bentolila and Bertola (1990), Bentolila and Saint-Paul (1992), and Boeri and Garibaldi (2007)]
- Blanchard and Landier (2002), Cahuc and Postel-Vinay (2002), and Wasmer (1999) among others stress risks of two-tier labour markets.

# Previous studies

- Ichino et al (2008) show that being on a temp contract has a causal effect on the probability of finding a permanent match (good screening devices). Temp contract should then increase productivity.

- Some recent papers on the effects of EPL on productivity.
  - Autor, Kerr and Kugler (2007). Find small negative effects (not always significant) of EPL on TFP and labour productivity using US cross-state variation
  - Cingano et al. (2008 and 2009). Diff in Diff approach following a Italian EPL reform and cross country evidence. Mixed evidence regarding productivity, EPL triggers capital/labor substitution.
  - Bassanini et al. (2008). Sectoral cross-country exercise . Negative effect of EPL on TFP

# Theoretical background

EPL and K/L (ambiguous effect)

- An increase in the cost of labour may imply substitution of labour with more capital: higher K/L
- In models with wage bargaining between workers and firms there may be the opposite effect "hold up": workers will use the protection of EPL to claim higher wages and firms reduce investment: lower K/L

EPL might increase labour productivity:

- by spurring innovation of incumbents in order to avoid downsizing (Koeniger, 2005)
- by encouraging investments in specific HK (Wasmer 2006, Belot et al., 2007) firms become more selective at the time of hiring, and less productive matches are not realized (Lagos, 2006)

EPL might reduce labour productivity:

- by reducing innovation of new entrants (Koeniger, 2005)
- by discouraging worker effort (Riphahn, 2004 and 2005)
- by reducing the risk level firms are willing to take: they will only engage in secondary innovation (Saint-Paul, 2002)

# Estimating framework

- We have data on i=1..N observed over t=2004...2007.
- Using firms' sector and location we can determine whether they were exposed to the institutional changes over time (no one exposed in 2004)
- Let $d^F it$ and $d^A it$ be dummy variables indicating whether in year *t* firm *i* was exposed to the reform of fixed-term (*F*) or apprenticeships (*A*).
- Our main estimating equation is

$$y_{it} = \beta' x_{it} + \gamma^F d^F_{it} + \gamma^A d^A_{it} + \varepsilon_{it}$$

where $y_{it}$ is a measure of firm outcome and x includes controls for region sector and time periods.

- Outcome measures: job flows, productivity, investments, capital labour ratio

## Estimating framework

- We also provide a direct assessment of substitution effects across different types of labour

- Generalised CES production function:

$$Y_{it} = K_{it}^{\alpha}\left[L_{pit}^{\sigma} + \left(\Sigma_{\tau} L_{\tau it}^{\rho}\right)^{\sigma/\rho}\right]^{(1-\alpha)/\sigma}$$

$1/(1-\sigma)$ *elasiticity of subst. temp and permanent contracts:* $L_p$

$1/(1-\rho)$ *elasiticity of subst. different types of temp contracts:* $L_\tau$

# Data

- Excelsior-Asia database
- Balanced panel of about 13000 firms observed over the years 2004-2007.
- Information on the types of employment contracts used within the firm
- Balance sheet information: value added and capital stock

# Data

Table 1: Descriptive statistics: composition by type of contract

| | Permanent | Fixed term | Apprentices | Agency | Collaborators |
|---|---|---|---|---|---|
| Overall | 0.88 | 0.06 | 0.02 | 0.02 | 0.02 |
| 2004 | 0.87 | 0.05 | 0.02 | 0.02 | 0.03 |
| 2005 | 0.88 | 0.06 | 0.02 | 0.02 | 0.02 |
| 2006 | 0.88 | 0.06 | 0.02 | 0.02 | 0.02 |
| 2007 | 0.88 | 0.06 | 0.02 | 0.02 | 0.02 |
| Manufacturing | 0.89 | 0.05 | 0.02 | 0.03 | 0.02 |
| Energy | 0.91 | 0.04 | 0.01 | 0.01 | 0.03 |
| Construction | 0.88 | 0.06 | 0.03 | 0.01 | 0.02 |
| Retail trade | 0.88 | 0.05 | 0.03 | 0.02 | 0.02 |
| Hotel and restaurant | 0.79 | 0.14 | 0.04 | 0.02 | 0.01 |
| Transports | 0.9 | 0.06 | 0.01 | 0.01 | 0.02 |
| Real estate | 0.86 | 0.06 | 0.02 | 0.01 | 0.05 |
| Private education | 0.7 | 0.15 | 0.01 | 0.01 | 0.14 |
| Private health | 0.86 | 0.09 | 0 | 0 | 0.04 |
| Other services | 0.83 | 0.11 | 0.02 | 0.01 | 0.04 |
| North west | 0.89 | 0.05 | 0.02 | 0.03 | 0.02 |
| North east | 0.87 | 0.06 | 0.02 | 0.02 | 0.02 |
| Centre | 0.86 | 0.06 | 0.03 | 0.02 | 0.03 |
| South and Islands | 0.88 | 0.06 | 0.02 | 0.01 | 0.03 |
| Reform of fixed contracts | | | | | |
| No | 0.87 | 0.06 | 0.02 | 0.02 | 0.03 |
| Yes | 0.89 | 0.05 | 0.02 | 0.02 | 0.02 |
| Reform of apprentices | | | | | |
| No | 0.88 | 0.05 | 0.02 | 0.02 | 0.03 |
| Yes | 0.88 | 0.06 | 0.02 | 0.02 | 0.02 |

Source: Excelsion database 2004-2007, total number of observations 53,197.

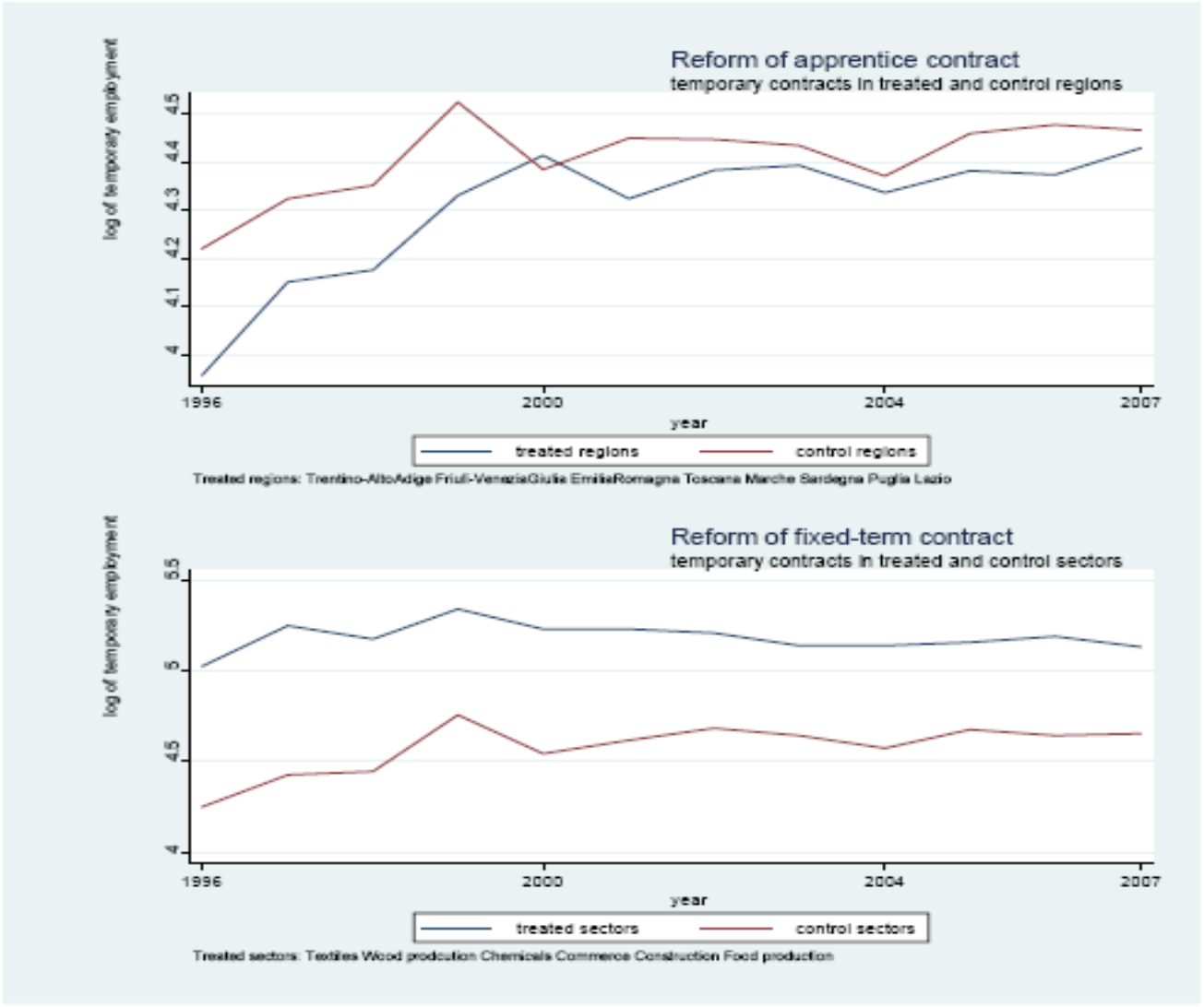


Figure 1: Log employment in temporary contracts in treated and control samples.

Table 2: Preceding trends in temporary employment do not affect adoption

| Dep.var. | app_reform | app_reform | fixed_reform | fixed_reform |
|---|---|---|---|---|
| % female | | -0.497 | | -0.372 |
| | | (1.174) | | (2.529) |
| % university graduates | | -0.839 | | -1.622 |
| | | (1.023) | | (2.403) |
| log temp empl | 0.077 | 0.059 | 0.383 | 0.414 |
| | (0.087) | (0.093) | (0.308) | (0.325) |
| log temp empl t-1 | 0.018 | 0.012 | -0.213 | -0.210 |
| | (0.085) | (0.091) | (0.332) | (0.344) |
| log temp empl t-2 | 0.132 | 0.120 | -0.336 | -0.336 |
| | (0.089) | (0.095) | (0.235) | (0.252) |
| log temp empl t-3 | 0.003 | 0.005 | 0.0961 | 0.146 |
| | (0.084) | (0.085) | (0.312) | (0.354) |
| log temp empl t-4 | 0.056 | 0.0511 | 0.0324 | 0.0619 |
| | (0.087) | (0.089) | (0.288) | (0.310) |
| log temp empl t+1 | 0.048 | 0.030 | 0.108 | 0.107 |
| | (0.080) | (0.084) | (0.246) | (0.258) |
| log temp empl t+2 | 0.093 | 0.082 | -0.322 | -0.351 |
| | (0.091) | (0.093) | (0.301) | (0.320) |
| Constant | -1.952 | -1.219 | -2.939 | -2.385 |
| | (1.612) | (2.018) | (9.084) | (9.729) |
| Region trends | NO | YES | NO | YES |
| Sector trends | NO | YES | NO | YES |
| Observations | 95 | 95 | 60 | 60 |
| R-squared | 0.387 | 0.397 | 0.567 | 0.584 |

Notes: Source LFS 1996-2007 collapsed by region (app_reform) and by sector (fixed_reform). Dependent variable is reform dummy, additional controls include year, region and sector dummies. Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

# Results (1): Job flows

Table 3: The effect of reforms on job reallocation by type of contract

| | | | *PANEL A* | | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Dep. var. | All contracts | Permanent | Fixed-term | Apprentices | Agency | Collaborators |
| app_reform | 0.002 | 0.004 | 0.014 | 0.039*** | 0.025* | 0.013 |
| | (0.002) | (0.004) | (0.015) | (0.013) | (0.013) | (0.015) |
| fixed_reform | -0.009*** | -0.013*** | 0.009 | -0.006 | -0.016 | 0.022* |
| | (0.002) | (0.003) | (0.011) | (0.010) | (0.011) | (0.011) |
| Constant | -0.018 | 0.005 | 0.028 | 0.010 | -0.096*** | -0.184*** |
| | (0.011) | (0.017) | (0.049) | (0.038) | (0.028) | (0.043) |
| Observations | 39857 | 39857 | 39857 | 39857 | 39857 | 39857 |
| R-squared | 0.006 | 0.003 | 0.001 | 0.001 | 0.002 | 0.002 |
| | | | *PANEL B* | | | |
| Dep. var. | All contracts | Permanent | Fixed-term | Apprentices | Agency | Collaborators |
| app_reform | 0.003 | 0.001 | 0.008 | 0.051*** | 0.031** | 0.008 |
| | (0.003) | (0.004) | (0.017) | (0.014) | (0.015) | (0.016) |
| fixed_reform | -0.009*** | -0.013*** | 0.010 | -0.008 | -0.017 | 0.022* |
| | (0.002) | (0.003) | (0.011) | (0.010) | (0.011) | (0.011) |
| Constant | -0.007 | 0.021 | 0.164* | -0.005 | -0.096* | -0.079 |
| | (0.021) | (0.031) | (0.085) | (0.065) | (0.057) | (0.094) |
| Observations | 39857 | 39857 | 39857 | 39857 | 39857 | 39857 |
| R-squared | 0.008 | 0.007 | 0.003 | 0.003 | 0.003 | 0.003 |

# Results (2): Productivity

Table 4: The effect of reforms on labor productivity

| Dep. var. | log labor prod | log labor prod |
|---|---|---|
| app_reform | 0.021** | 0.020** |
| | (0.008) | (0.009) |
| fixed_reform | -0.018 | -0.022* |
| | (0.011) | (0.012) |
| Constant | 11.05*** | 11.08*** |
| | (0.047) | (0.054) |
| Region trends | NO | YES |
| Sector trends | NO | YES |
| Observations | 52840 | 52840 |
| R-squared | 0.115 | 0.124 |

Notes: The dependent variable is the log of value added divided by the total number of employees. All regressions include controls for time, region and industry. Robust variance estimates account for repeated observation on the same firm over time. Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

# Results (3): Investments and capital

Table 5: The effect of reforms on capital intensity and investment

| Dep. var. | log K/L | log K/L | log I/L | log I/L |
|---|---|---|---|---|
| app_reform | -0.087*** | -0.092*** | -0.144*** | -0.179*** |
| | (0.022) | (0.024) | (0.046) | (0.054) |
| fixed_reform | 0.180*** | 0.195*** | 0.086* | 0.091* |
| | (0.027) | (0.030) | (0.052) | (0.052) |
| Constant | 10.99*** | 10.98*** | 8.896*** | 8.894*** |
| | (0.099) | (0.116) | (0.162) | (0.164) |
| Region trends | NO | YES | NO | YES |
| Sector trends | NO | YES | NO | YES |
| Observations | 52970 | 52970 | 15440 | 15440 |
| R-squared | 0.168 | 0.168 | 0.089 | 0.091 |

Note: Investment has 39,857 observations but many zeros. All regressions include controls for time, region and industry. Robust variance estimates account for repeated observation on the same firm over time. Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1.

# Results (3): CES substitution elasticities

Table 6: Elasticity of substitution between temporary contracts and with open-ended contracts

| Year | 2004-2007 | 2004 | 2005 | 2006 | 2007 |
|---|---|---|---|---|---|
| $\eta_\rho$ (across temp contracts) | 1.392*** | 1.215*** | 1.802* | 1.478*** | -0.780 |
| | (0.148) | (0.113) | (1.023) | (0.223) | (6.898) |
| $\eta_\sigma$ (betw. temp and perm contracts) | 1.062*** | 1.070*** | 1.058*** | 1.060*** | 1.056*** |
| | (0.254) | (0.085) | (0.040) | (0.220) | (0.092) |
| Observations | 53145 | 13287 | 13286 | 13286 | 13286 |

Notes: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

# Conclusions

- The reform of apprenticeships seems to have been successful: it increased turnover of workers and induced capital-labor substitution in favour of labor, increasing labor productivity.
- The institutional changes of fixed terms instead does not seem to have had the intended results. It may have made the use of tempo determinato more costly rather than less costly as already pointed out by some literature in labor law.
- If the latter changes have hampered job reallocation across and within firms (for example because it raises costs of consultancy for fear of the courts), then productivity falls.
- We find that capital intensity is increased after changes in fixed terms which may be interpreted as evidence that they made the use of labor more costly relative to capital.
- We find a sizeable degree of substitution across contract types, consistent with our interpretation.