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TRENDS IN THE LABOUR MARKET: ISSUES STILL OPEN FOR THE ANALYSIS

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Abstract *The availability of dynamic databases to analyse the Italian labour market is still unsatisfactory because of many constraints that impede research on causal correlations between employment trends and economic-juridical background. The Italian labour market normative scheme was totally renovated at the beginning of the 21th century but the reform effects on employment and production are still partially known. In this paper, the economic statistical effects of the promulgated labour market reforms on the workforce dynamics are investigated through a graphical-matrix approach that uses ISTAT official data and administrative microdata from Veneto Labour Office. It is proved the undisclosed data from administrative databases alongside the official statistical information can allow to depict a picture of a complex phenomenon, as the Italian labour market is.*

Keywords: *Labour market, Administrative data, Official statistical data, Transition matrix.*

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1. INTRODUCTION

The third millennium, the same that was welcomed with fabulous celebrations all over the world, began unexpectedly with important disruptions to the global equilibrium in all aspects of the human life, and the world economy is still struggling to resist default and social fail, or recover from hard economic and social challenges. In fact, the innumerable economic structural breaks that occurred since the beginning of the 21th century have marked a turning point in the development of most economies around the world, both advanced and emerging/developing: in order, the US early recession and the Twin Towers attack in 2001 provoked global uncertainty; the great and long US recession in 2007 caused a global financial crisis because of the subprime mortgage crisis; the EU economic and financial crisis in 2008/2009 as a consequence of the American downturn; the EU sovereign debt crisis that started in 2009 and marked deeply the economy of some peripheric EU countries causing the Greek default and severe control policies of debt in all countries; the pandemic of SARS-Cov2 in 2020 tested again the global economy stability and, finally, the Russia-Ukraine conflict in 2022 provoked a deep increase of inflation all over the world.

Among all the serious consequences that the above picture yielded, the labour market of most countries suffered the economic depression and Italy was not beneath the others. In particular, for the period 2008-2013 the statistical data on the Italian labour market sketch an alarming depiction of the situation: the sharp drop in jobs; the increase of unemployment up to around 1.5million workforce, almost half in 2012; a rise of youth unemployment (+14.5%) that contributed 80% to the total unemployment rate over the period (+12.1%).

Therefore, in Italy the long recession of the economy and the complex situation of the labour market forced the Italian governments to address the problem to strengthen the manufacturing sector on one hand, and restrain the haemorrhage of jobs on the other. It is starting from 1997 that the Italian government gradually reformed the antiquated regulatory framework of the Italian labour market, still inappropriate to face the new economic challenges at that time. The cornerstone of the problem was focused on the labour market and its functioning: job creation, living standards and social cohesion depend on its ability to well operate. Therefore, the labour reforms that were implemented since the beginning of the new millennium turned the Italian labour regulation upside-down and the flexibility was the real challenge. It is important to consider that the economic context when all the mutations happened is characterised by continuous changes into the global productive process, more vulnerable, competitive and variable than in past, and

the Italian enterprises and companies needed to face the new globalised framework to save or gain important market shares. And in this context, a new regulation of the Italian labour market was extremely important to guarantee higher job flexibility on one hand, and a well-defined juridical protection of workers' rights on the other. Furthermore, it is important to bear in mind that, towards the end of the 20th century, the job flexibility was not only a milestone for Italy but also an important issue of the European agenda because rigidities of the labour markets were an obstacle to the development of many European countries and debates over probable solutions were in progress since the 1980s. However, it is not intention of this work to report and analyse the juridical intentions of the Italian legislator in his decisions of jurisprudence to revise the system of rules for the labour market. The framework of rules and norms that were approved in 18 years to update the Italian labour market is undoubtedly central to explain trends and magnitudes, but the economic statistical effects on the labour forces of the governmental interventions are under analysis, instead. In literature, the Italian labour market is extensively analysed not only to depict the status of the Italian workforce but also to evaluate the effects that the juridical and financial interventions have on its dynamics.

Some authors examine the effects that flexibility produces on the employment rate and firm productivity. Battisti and Vallanti (2013), in their analysis on the consequences that the decentralised wage schemes and the temporary job contracts have on worker/firm performance, demonstrated that the large flexibility in the working environment, namely the presence of many temporary contracts, implies a reduction in workers' motivation and effort, and lower probabilities of dismissal for workers with permanent contracts. Boeri and Garibaldi (2007) similarly argued that productivity experiences lower growth rates when firms hire temporary workers. Many researchers analyse the consequences of flexibility from the social point of view and its impact on the household economy. Tomelleri (2021) analysed the relationship between the temporary employment and the individual earnings to estimate the impact of the labour market reforms on income inequalities. And, in regard to this aspect, Hoffmann and Malacrino (2019) proved that the employment period length is the most important element of the increase in the Italian earnings. Many other scientists focused more on the impact that the Italian labour market reforms had on the Italian employment trends. And in particular, the last reform still effective and approved in Italy in 2014, implemented in 2015, named JOBS Act, is under deep investigation still now. Cirillo et al. (2017), for instance, tried to describe the first effects on the employment of the JOBS

Act and the extraordinary economic and financial measures that were planned to stimulate employment and, although the availability of data was limited and information aggregated, they concluded with first evidence of their negative effects on employment. Sestito and Viviano (2018) pointed out other important aspects of the JOBS Act and proved that the new firing rules as regulated in its normative framework stimulated the open-ended employment more than fixed-term. However, the complexity of the analysis of the Italian labour market, a key issue indeed, arises from the long reform phase that embraced 18 years since 1997 and, as we show next, experienced the overlapping of rules and economic-financial interventions that complicates the comprehension of trends and outcomes from the demand side. Furthermore, the limited availability of open data, both official and administrative, is a further complexity. Therefore, all researches conducted on the labour forces' dynamics and employment/unemployment in Italy are complementary analyses with all the others. In this paper, we analyse the evolution of employment in Italy from the juridical-economic perspective. In particular, through the utilisation of official statistical data and administrative microdata, we focus our attention on one of the Italian regions that is very active in terms of GDP, i.e. Veneto, and prove that the combination of several and variegated data sources as compiled by different subjects can allow to depict the labour market as a whole and solve some issue still unsolved, both statistical methodological and legal/pragmatical. As we already pointed out in a previous work (Marini and Nicolardi, 2021a), the administrative data are a precious source of information, but they are not exempt from many issues related to their nature: nonstatistical but administrative purposes; material and human errors; very large dimension, huge occasionally; variety of data primary sources; juridical because of the individual privacy. In particular, the availability of dynamic databases referring to the labour market is not satisfactory for the most various analytical purposes. In fact, in most cases, the problem is caused by the general data protection regulation that impedes the use of many precious data and, therefore, the analysis of the real effects of the labour market reforms. In theory, hence, there is a vast availability of data in many data formats, but they are not usable and mergeable with other data both official and administrative of various types. At the same time, the values and the different data sources are complete autonomously to yield a structural and complete analysis of the labour market because they are the outcome of administrative or institutional activities or surveys that are part of the work of the corresponding institution or administration or company. Furthermore, data that are more complete in terms of analytical potentialities are exclusively on the labour

demand side or labour supply side and, therefore, not appropriate for a dynamic analysis of the labour market that would need an alignment of both information. Therefore, the enormous potentialities of the administrative data collide with their ambiguities when the latter are not solved and statistically managed to harmonise and align the administrative data with official statistical data as yielded by the national institutes of statistics. The approach we use in this work is a graphical-matrix method to investigate the labour mobility: transition matrices jointly used with a graphical representation of the labour market flows. The use of the transition matrix is scientifically consolidated but not prevalent in the analytical context (Albisinni and Discenza, 2004; Bernardi and Zaccarin, 1984, 1991; Blumen et al., 1995; Ward-Warmedinger and Macchiarelli, 2013) and allows to grasp all changes in the job positions and the probability that each employee move from his working status to another. In the framework of the radical reforms that involved the Italian labour market, the analysis of the employment flows through the graphical-matrix method is a positive experiment to describe trends and the interconnected effects of a complicated scheme of rules and financial interventions to recognise all the opportunities and potentialities. In Marini and Nicolardi (2018) a first evaluation of the transition probabilities in the transition matrices was yielded as a proxy based on the official data as provided by the Italian National Institute of Statistics (ISTAT, hereafter) to estimate the change of job status from temporary to permanent job positions as a consequence of coming into effect of the last reform in 2015. This work is the progression of that first a pproach: information is integrated with administrative data, though referred to a single Italian region, and the stage of the analysis is sufficient to suppose the effectiveness of integrated data in examining complex social-economic phenomena.

The paper is organised as follows: a brief description of the process that reformed the Italian labour market is reported in Section 2; Section 3 describes the dataset contents and the outcome of the analysis; some concluding remarks are reported in Section 4.

2. THE LABOUR MARKET REFORM SCHEME

The labour market policies that were pursued in Italy between 1997 and 2014 had the great task to renovate and liberalise the employment policy, still obsolete and constrained by dated regulations. The revision process of the labour market policies was addressed to the active population in all ages and all status, both employed and unemployed/first-job seekers, both young and middle age. The process started in 1997 but the bulk of major reforms was introduced at the beginning of

the 21st century. In 1997 the Treu Reform (law n. 196/1997) took the first steps towards the job flexibility reducing the constraints that prevented firms from using fixed-term labour contracts and part-time labour contracts. In 2001, in compliance with the European directive n.1999/70/CE, the Italian government introduced the fixed-term causal labour contract that reduces slightly more the constraints on its use adducing adequate reasons related to selected manufacturing sectors, job titles and well-defined contingencies (legislative decree n.368/2001). At the beginning of the 21st century, in the light of a weak socio-economic context and a worrying employment stagnation, the semi-liberalisation of the fixed-term contract was a positive equilibrium between the entrepreneurial needs of job flexibility and the workers' necessity of socio-economic stability. In 2003, the Biagi Reform (legislative decree n.276/2003) continued along the path towards flexibility, reformed some pre-existing short-term contracts and introduced a wide variety of other short-term para-subordinated and non-standard employment contracts in the Italian labour market: on-call contract (lavoro intermittente), job sharing contract (lavoro ripartito), occasional employment (lavoro occasionale), project-job contract (lavoro a progetto), coordinated and continuous collaborations (co.co.co.), outsourcing or staff-leasing contract (somministrazione) and entry position or training contract (contratto di inserimento).

A first interesting summary of the effects that were yielded by the introduc-tion of the short-term and non-standard employment contracts in the Italian labour market still unprepared for the great change can be find in Tealdi (2011): to prove the discrimination in terms of the rights experienced by the short-term workers, the author analysed the characteristics of all contracts (both permanent and fixed-term and temporary) that were considered in the Treu Reform (1997) and Biagi Reform (2003), how they changed between the two reforms and how their use and worker's benefits were affected by the two reforms over time. Others (Daruich et al., 2023) focused their analysis on the legislative decree n.368/2001 that, as explained before, introduced new rules for the fixed-term causal labour contract: to evaluate the impact that the new policy of the labour market had on the Italian employment as a whole, on jobs, firms, and workers and across different sectoral collective bargaining agreements, the authors used longitudinal data combining matched employer-employee data with firms' financial records and proved that firms experienced great advantages from the policy, while young workers were more penalised.

In 2012, the alarming employment stagnation and the high uncertainty about the economic-financial situation forced the Italian government to reform again

rules and norms of the Italian labour market. The Fornero Reform (law n.92/2012), the big and severe reform of the Italian labour market, promoted the open-ended contract, enhanced the apprenticeship contract for young, widened the range of applicability of the fixed-term contracts although restricted their use (only one renewal) and duration (max 36 months) and, more important and controversial, reduced the effectiveness of the worker protection in case of illicit layoff (Articolo 18). In 2014, the Poletti Decree (legislative decree n.34/2014) and the Jumpstart Our Business Startups Act, known as JOBS Act (law n.183/2014) were passed. The Poletti Decree enhanced the fixed-term contracts considerably reducing at minimum the constraints on their use and introduced the sole obligation that the ratio of fixed-term contracts to open-ended contracts would not exceed 20%. Instead, the JOBS Act (JA, hereafter), the last and still effective reform, the controversial and debated law, introduced in the jurisprudential scheme of the Italian labour market considerable innovations: a new revision to the fixed-term contract (duration up to 36 months plus one renewal of 12 months) and the removal of all causality constraints; the abrogation of Articolo 18; the contested revision of the open-ended contracts that reduced the protection against just cause dismissals; the introduction and promotion of the new open-ended contract known as "increasing protection" contract (contratto a tutele crescenti) that provides only an economic compensation in case of illicit layoff; the promotion of the apprenticeship contract; the revision of the outsourcing contract and the removal of the project-job contract.

The three major labour market reforms described above (i.e. Biagi Reform, Fornero Reform and JA) included clauses of some monetary incentives taking the form of some discount in firms' social contribution burden per employee to enhance employment of vulnerable segments of workforce, namely women and young, but JA was the reform among them that could also rely on two extraordinary governmental financial plans addressed to all labour forces. In fact, just before the promulgation of JA (March 2015) and the introduction of the "increasing protection" contract in the new regulation of the Italian labour market, important and significant financial measures, as provided in the 2015 Stability Law (law 190/2014, implemented in January 2015), planned monetary extraordinary incentives as a 100% discount in social contribution burden per employee for a 3-year period for those firms that in 2015 hired people with permanent job contracts or transformed temporary job contracts/fixed-term contracts in permanent job contracts for people already employed. The financial measure was replicated in the 2016 Stability Law (law 208/2015, implemented in January 2016) although the

monetary incentives amounted to a 60% discount in social contributions for a 2-year period. Though the two extraordinary governmental financial plans covered two different periods and the magnitude of discounts in firms' social contribution burden per employee is different, all monetary incentives ended in December 2017.

3. THE DATA

In this work, the datasets used to defend our assumption about the potentiality of an integrated information from the demand and supply side are fundamentally two.

The first is the data warehouse of ISTAT, named I.Stat, that is easily available online. The time series of the section Labour Offer contains data from the Labour Force Survey referred to annual, quarterly and monthly information on labour forces for the whole country and the levels NUTS 1, 2 and 3. We name this database LFS.DB. At the time of this work, the up-to-date information was referred to the 2nd Quarter 2022 and we decided to end the period under analysis in 2020, without affecting our outcomes. That was a pragmatic analytical decision to avoid the structural break that occurred in all socio-economic time series because of the SARS-Cov2 pandemic.

The second is the database of the Italian Ministry of Labour and Social Policies for the Region Veneto. The Veneto database (Ven.DB, hereafter) is the only administrative database easily available under request that provides a detailed and complete information of the individual working status over time. Ven.DB contains flow data that derive from the mandatory communications that, based on the regulation of the Italian labour market, employers have to compile when a new employee is hired or changes occurred on the existing contracts. The mandatory communications contain many information on the employer, employee, typology of contract, duration of the contract, and any change about the contract such as transformations, extensions and termination (Marini and Nicolardi, 2017). The great job that Veneto Labour Office made to provide undisclosed microdata referred to all regional individual jobs and contracts is the main reason why its database is available for deep analyses of the regional labour market. As many administrative databases, Ven.DB is not exempt from the problems that characterise the non-official statistical information although the Veneto Labour Office tried to solve many issues. Therefore, the procedure to deal with this type of data, as shown in Marini and Nicolardi (2021a), has been applied to homogenise information and use the same in the best way. Furthermore, it is important to consider

that a further issue is the dimension of Ven.DB that is quite large to be considered in the Big Data scenario (Marini and Nicolardi, 2021b). Finally, as well known, Veneto is one of Italian regions where the performance in terms of employment is great and significant. Therefore, in our experiment, we are considering Veneto as a territorial proxy to evaluate the informative contents of the administrative data for the whole country. At the time of this work, the up-to-date information was refereed to 2017 and, however, this time is adequate to analyse the first effects of all labour market reforms and monetary incentives as described in Section 2. Table 1 shows the numerical structural characteristics of the key fields in Ven.DB at the time of our analysis.

Table 1: Veneto Lavoro database contents.

Job positions	17,604,175
Employees	3,692,529
Employers	892,084
Working locations	6,954
NACE codes (ATECO 2007)	919

Therefore, the starting year of the period under investigation is the same for both databases, i.e. 2011, but the ending period is different, i.e. 2017 in Ven.DB and 2020 in LFS.DB. Some clarification is necessary to explain the reasons behind the differentiated period and the starting date, as described above. First, 2011 is statistically the right year to start the evaluation of the effects of the two most debated reforms (as described in Section 2) that deeply changed the Italian labour market. Second, the LFS.DB data consent to grasp the effects of both the monetary incentives and the new rules (as defined in JA) on employment owing to the length of its time-series, while Ven.DB data are important to grasp the transitions between different working positions mainly owing to the monetary incentives because data are referred to a time interval, though shorter then LFS.DB, that covers the period involved. It is important, however, to underline that the conclusion on the assumption we are defending in this paper is not affected by the two different lengths of the time intervals.

In the analysis, we decided to focus our attention on the two contracts of employment that were the main targets of the last two labour market reforms, namely Fornero Reform and JA, trying to prove the effectiveness of the new juridical assets over time. Therefore, the open-ended contract and the fixed-term contract are

under investigation through LFS.DB and Ven.DB.

The first information that is important to highlight is referred to the magnitude of the two contracts as occurred in Italy. Figure 1 shows the distribution of employees with open-ended contracts (light grey) and fixed-term contracts (dark grey) over the period 2011-2020, ISTAT data. As expected, the open-ended contract is the primary status of employment in the Italian labour market all over the period: 14.8 million of employees (85.3%) versus 2.5 million of fixed-term contract employees (14.7%), on average over the whole period.

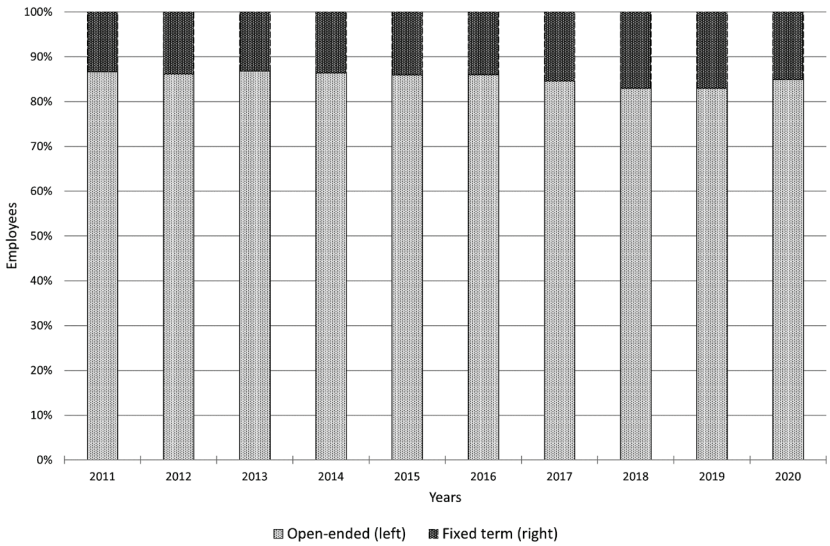


Figure 1: Distribution of employees with fixed-term contracts and open-ended contracts. Years 2011-2020.

Figure 2 shows more clearly in a double axis chart the ISTAT employment trends in the two contracts: open-ended contracts (continuous line) and fixed-term contracts (dash line). Trends of both contracts are quite similar although their paths appear to be differently affected by the political and juridical interventions starting from 2015, when the JA and the monetary incentives were planned to support the Italian labour market.

The analysis of the annual rates of change in the use of the two contracts under investigation, over the whole period, as shown in Figure 3, allows to suppose that the juridical and economic interventions effectively succeeded in the intention of the legislator to stimulate the permanent employment more that the temporary

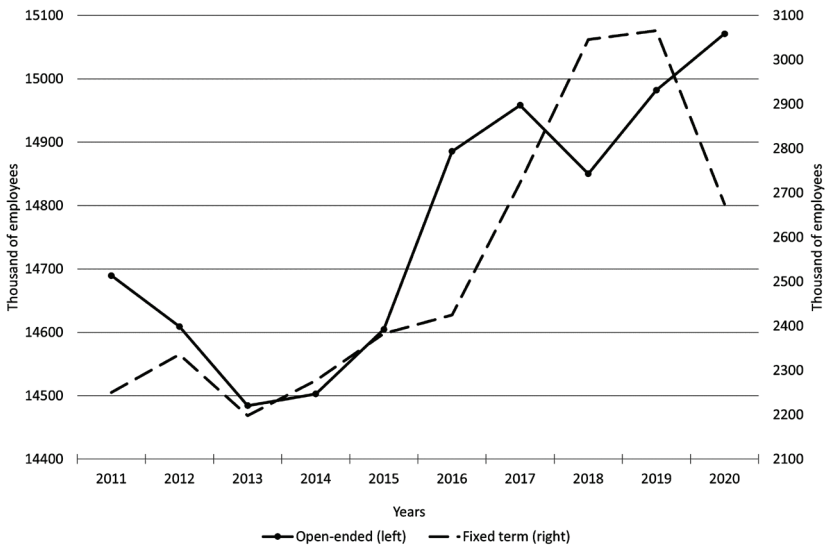


Figure 2: Italian employment trends in open-ended and fixed-term contracts. Thousand of employees. Years 2011-2020.

when they were simultaneously effective. At the same time, the end of the monetary incentives (year 2017) to permanently hire people or transform their contracts from fixed-term to open-ended slowed down the permanent employment (Fig. 3) until 2018, when the same decreased, while the fixed-term employees started increasing sharply in 2017 until 2019, right before the SARS-Cov2 period[3]. This last increase in the fixed-term contracts can be the outcome of the liberalisation of the fixed-term contract use, which the JA regulates, due to the removal of all causality constraints previously effective. It is important to note that the Fornero Reform had little effects on the employment for both types of contracts mainly because of the negative economic conjuncture caused by the EU sovereign debt crisis.

The implementation of a linear regression model in time series that involves economic variables is worthy to sustain hour hypothesis. Let PE_t denotes the amount of permanent employees by quarter t, SPI_t denotes the seasonal adjusted industrial production index at quarter t as a proxy of the Italian economic perfor-

[3]The year 2020 represents a structural break in the world economy because of the effects of the lockdown caused by the SARS-Cov2 pandemic. This is the reason why we preferred to not compare this value with the rest of the time series.

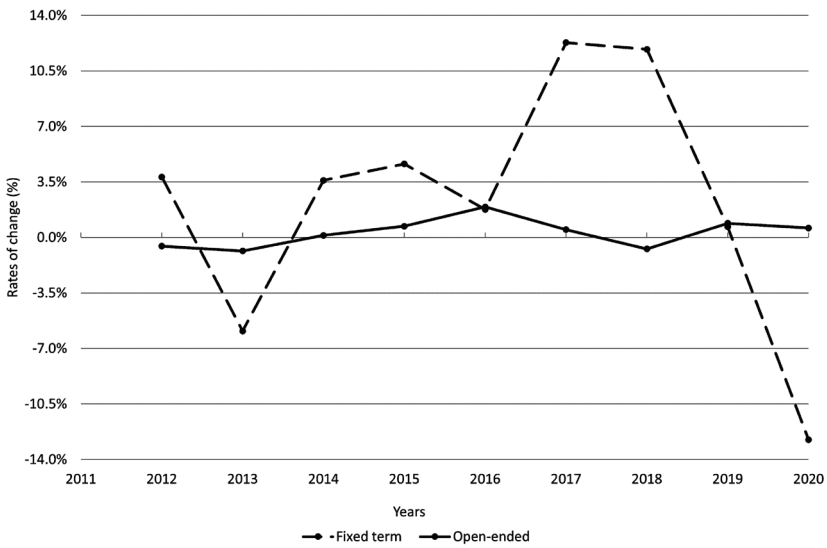


Figure 3: Italian employment trends in open-ended and fixed-term contracts. Annual rates of change. Years 2011-2020.

mance, $dEMI_t$ is a dummy variable at quarter t equal to 1 when the extraordinary monetary incentives are applied and t denotes the time trend variable. Then, the model is defined as follows:

$$PE_t = \alpha + \beta_1 \, PE_{t-1} + \beta_2 \, SPI_{t-1} + \beta_3 \, dEMI_t + \beta_4 \, t + \beta_5 \, t^2 + u_t \qquad (1)$$

Table 2 summarises the OLS estimates of the model, where standard errors are in parentheses and stars denote $p-values$. As expected, based on the assumptions of our hypotheses, it is confirmed that the significance of the implementation of the extraordinary monetary incentives produced, over the period considered, a positive effect on the amount of permanent employees, higher than the effect deriving from the economic performance. The specification analysis confirms the conclusion of our experiment in terms of econometric aspects.

When the focus of the analysis is circumscribed to Veneto, because of the regional data availability from the administrative side, based on ISTAT data it apparently appears that the regulatory framework experienced a major role in the employment performance than the financial-economic incentives. In particular, the regulation that the JA introduced, referred to the fixed-term contracts, led to

Table 2: OLS linear model regression results for the extraordinary monetary incentives of JA

α	7744.2***	(1610.1)
β_1	0.441577***	(0.113)
β_2	4.69393**	(2.023)
β_3	134.510***	(32.801)
β_4	-14.6054***	(5.135)
β_5	0.469966***	(0.127)

*** p-value < 0.01
** p-value < 0.05

a significant increase in the number of temporary employees, (55 thousand, i.e. 27.4%, ISTAT data) and only a modest growth of the number of permanent workers (38 thousand, i.e. +2.8%, ISTAT data) over the period 2015-2017. Figure 4 is a double chart that depicts the Veneto employment trends: above, ISTAT employment trends in open-ended contracts (continuous line) and fixed-term contracts (dash line); below, Ven.DB employment contracts trends that report the open-ended contracts (continuous line), both new and transformed, and the new fixed-term contracts (dash line). The two graphs apparently show opposite trends in the two contracts but the mistake is driven by the two different typologies of data that LFS.DB and Ven.DB contain: the first are always stock measurements and provide the number of employees; the second are flow measures and provide the amounts of new contracts that are signed over the period.

Therefore, the ISTAT graph (Figure 4a) shows trends roughly aligned with the corresponding national trends, although more accentuated because of the characteristics of the Veneto economic system, always more dynamic than the national over the period under investigation, as often highlighted in the series Economie Regionali (that is Regional Economies) of the Bank of Italy and the series Rapporto Statistico (that is Statistical Report) of the Veneto Region[4].

Ven.DB (Figure 4b) highlights, instead, a significant increase in the new open-ended contracts in 2015 and a steady increase in the new fixed-term con-

[4] An overview of the economic sectors based on data for Veneto from LFS.DB shows that, over the whole period, most of the regional workers are in the service activities (namely, all NACE Sections between J and U) that employed, on average, 42% of people, to whom it is necessary to add the employees in the turistic and trade activities (NACE Sectors between G and I) that are around 20%, on average; the manifacturing, mining and quarrying activities (NACE Sectors between B and E) employed 28%, on average, of workers in Veneto.

tracts over the period 2014-2016.

The outcome from the Veneto Labour Office data confirms that the monetary incentives, as in the 2015 Stability Law, had a surprising effect on the open-ended contracts (+77.7%) on the demand side, i.e. entrepreneurs, as the legislator prefigured in his economic intervention, but it is important to suppose that many can be transformations from temporary to permanent positions. Although the Ven.DB fixed-term contract trend can prove our hypothesis (Figure 4b), we need the transition flows between the two job positions to confirm that. Ven.DB data are helpful for this proof and they are used to compute the transition values we need. Figure 5 shows a bar chart where the transition flows from temporary contracts towards permanent contracts are depicted, including also other popular short-term contracts as regulated by Fornero Reform and JA to stimulate the youth employment, namely outsourcing, training and apprenticeship contracts.

Figure 5 shows the confirmation of our assumption and, in particular, the proof of the extraordinary increase of open-ended contracts in 2015 that was strengthened by the exceptional monetary incentive that definitely supported the JA. Table 3 shows the transition flows from the fixed-term contract to the open-ended contract, by age-class for the whole period. The transition flows indicate the number of persons changing their labour status between two time periods, that is changes between temporary and permanent job positions in our analysis. As expected, the magnitude of transitions is significant in 2015 (56,747) and represents the 34.3% of the total open-ended contracts and the 12.4% of the total fixed-term contracts signed in the same year. Another valued outcome to highlight is referred to the distribution by age of the transition flows. In particular, most of the transformations from fixed-term positions to permanent occurred among employees at age 26 or more, over the whole period.

Table 4 shows the transition flows (in percentage) from the fixed-term contract to the open-ended contract in relation to total amount of fixed-term contracts, by age-class for the whole period. In particular, as shown in Table 4, in 2015 and 2016 the age-class 26-30 experienced more advantages (15.2% and 10.6%,respectively) from the monetary incentives to transform the employment contract from fixed-term to permanent than the other age classes.

Another valuable outcome that we wish to highlight is related to the apprenticeship contract. The apprenticeship is considered the most important contract to facilitate the youth employment in both reforms, and the legislator provided for monetary incentives to also transform the apprenticeship contract into open-ended contract. As shown in Figure 5, between 2013-2017 transformations of

Table 3: Veneto transition flows from fixed-term contracts to open-ended contracts. Years 2011-2017.

	Years						
Age	2011	2012	2013	2014	2015	2016	2017
< 21	1,142	1,264	943	836	1,651	1,077	886
21-25	5,027	5,579	4,443	3,901	7,382	5,102	4,279
26-30	6,868	7,203	5,851	5,328	9,654	6,950	5,528
31-35	7,432	7,253	5,852	5,198	8,731	6,179	4,931
36-40	6,737	6,859	5,691	4,810	8,499	5,811	4,523
41-45	5,779	5,921	4,971	4,205	8,025	5,569	4,472
46-50	3,974	4,301	3,640	3,264	6,408	4,747	3,687
51-55	2,204	2,453	2,251	1,957	4,054	3,043	2,505
56-60	927	992	995	868	1,863	1,334	1,106
> 60	240	319	297	287	480	375	329
Total	40,330	42,144	34,934	30,654	56,747	40,187	32,246

apprenticeship positions into permanent are relevant, although relatively little in their amount. In fact, the apprenticeship contract is on average 3.7% of all job positions over the whole period, and the great part of them involved young at age between 19 and 21. Table 5 reports the transition flows from the apprenticeship contract to the open-ended contract, by age for the whole period.

The outcome that is important to underline is that the transition between the two job positions hastened over the period and involved the youngest apprentices towards the end (Table 5).

4. CONCLUDING REMARKS

Two key issues are addressed in this paper: 1. the effectiveness of political interventions that occurred in Italy over a period of 18 years (starting from 1997) to radically reform the Italian labour market to stimulate employment and production; 2. potentialities and opportunities of an integrated information where official statistical and administrative data are aligned to examine complex socio-economic phenomena. In this work, the data warehouse I.Stat from ISTAT and the administrative database provided by Veneto Labour Office are used to analyse the Italian labour market over the period 2011-2020, which embraces the promul-

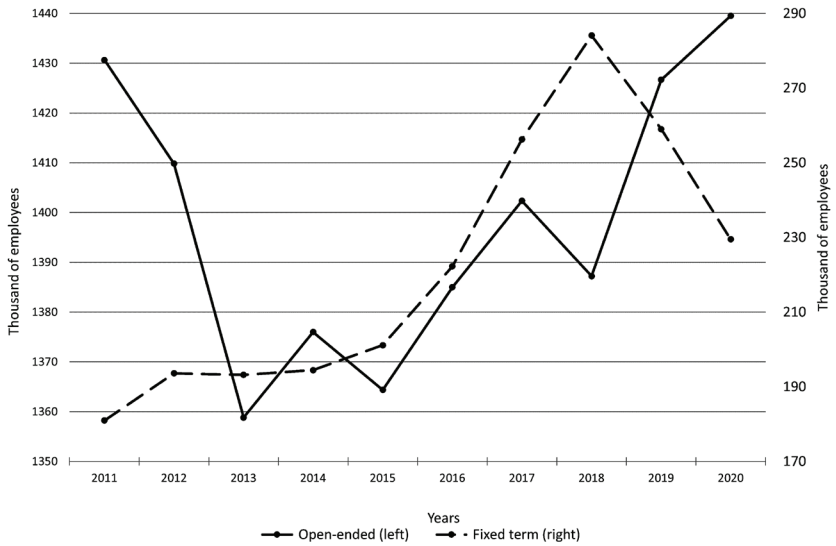
Table 4: Veneto transformation flows from the fixed-term contracts to the open-ended contracts compared to the fixed-term contracts (per cent values). Years 2011-2017.

	Years						
Age	2011	2012	2013	2014	2015	2016	2017
< 21	6.0%	7.0%	5.4%	4.6%	8.3%	5.0%	2.9%
21-25	9.1%	10.6%	8.1%	6.7%	13.0%	8.3%	5.7%
26-30	10.4%	11.5%	9.8%	8.4%	15.2%	10.6%	7.2%
31-35	10.6%	11.0%	9.0%	7.6%	13.8%	10.2%	7.3%
36-40	10.3%	10.9%	8.9%	7.1%	13.1%	9.7%	6.9%
41-45	10.1%	10.4%	8.5%	6.7%	12.7%	9.2%	6.6%
46-50	9.1%	9.6%	7.5%	6.1%	11.9%	9.0%	6.1%
51-55	8.0%	8.5%	7.1%	5.4%	10.4%	7.7%	5.3%
56-60	6.1%	6.1%	5.8%	4.5%	8.8%	5.9%	3.9%
> 60	2.6%	3.4%	3.0%	2.7%	4.1%	2.7%	1.5%
Total	9.4%	10.1%	8.2%	6.7%	12.4%	8.8%	5.9%

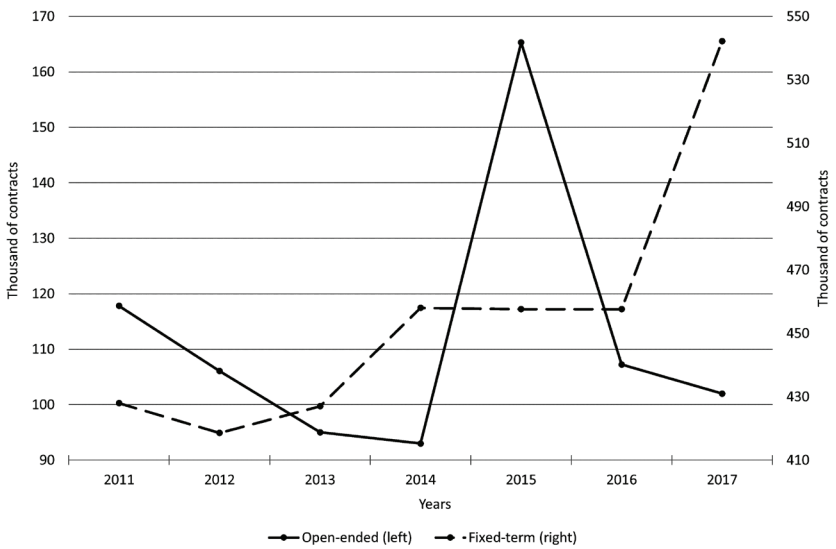
gation of the two more debated Italian reforms, the Fornero Reform (2012) and the JOBS Act (2015). The approach we used in this work is a graphical-matrix method to investigate the labour mobility: transition matrices jointly used with a graphical representation of the labour market flows. The outcome we obtained allowed to conclude that the analysis of the Italian labour market is detailed when the undisclosed data from administrative databases, as the Veneto Labour Office case, are available to complete the official statistical information, as provided by the national institutes of statistics. This would allow to highlight the interconnected and overlapped effects of any juridical and monetary interventions that differently are not affordable. This work is still a preliminary experiment conducted to test opportunities to solve some statistical methodological issues still open in the scientific debate referred to the integration of administrative data and official data to analyse complex social p henomena. Longitudinal statistical data on labour market provided by ISTAT, recently available on request, are definitely a chance to resolve the information gap that the available open data experience. Further investigations will be conducted in this sense to update this our first analysis alongside a restricted causal analysis of data from Ven.DB to investigate the connection between the labour market policies and the employment trends.

Table 5: Veneto transition flows from the apprenticeship contract to the open-ended contract. Years 2011-2017.

	Years						
Age	2011	2012	2013	2014	2015	2016	2017
< 17	1	21	28	14	13	3	8
17	15	64	131	102	135	81	43
18	36	104	192	267	411	267	186
19	84	209	445	673	973	655	458
20	135	299	701	1,089	1,664	1,140	985
21	147	344	577	995	1,329	1,003	892
22	181	355	461	721	1,032	812	716
23	144	304	419	605	855	750	636
24	134	246	337	528	848	695	666
25	111	228	355	539	839	849	691
26	103	214	342	478	799	735	643
27	80	188	228	423	644	566	556
28	62	134	201	332	534	516	422
29	38	102	146	211	377	414	350
30	22	55	73	100	195	224	217
> 30	21	31	8	9	10	20	6
Total	1,314	2,898	4,644	7,086	10,658	8,730	7,475



(a) data source: LFS.DB database.



(b) data source: Ven.DB database.

Figure 4: Veneto employment trends in open-ended and fixed-term contracts. Years 2011-2020 LFS.DB (a): thousand of employees. Years 2011-2017 Ven.DB (b): thousand of contracts.

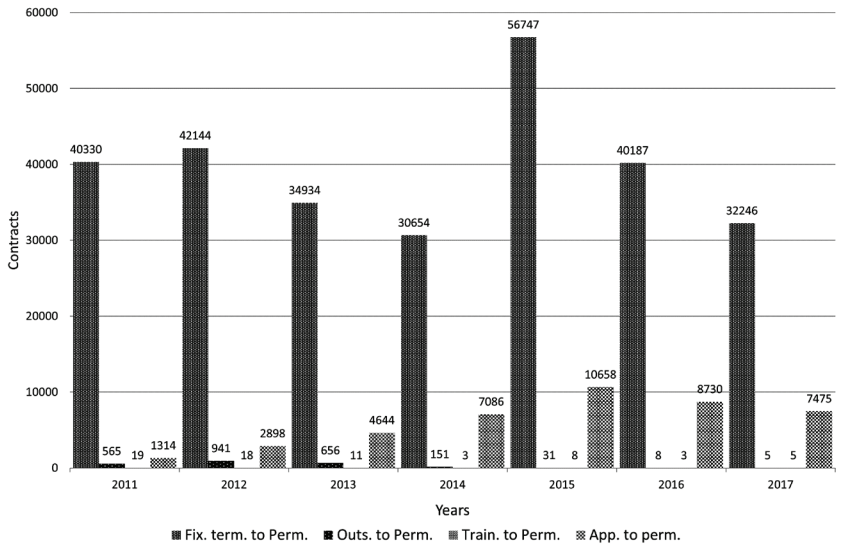


Figure 5: Veneto transition flows from temporary job contracts to permanent job contracts. Years 2011-2017.

References

Albisinni, M. and Discenza, A. (2004). *La mobilitá dell'occupazione e della disoccupazione dalla seconda parte degli anni Novanta*. Sistema Previdenza, XXI. N. 3, pp. 47-67.

Battisti, M. and Vallanti, G. (2013). Flexible wage contracts, temporary jobs, and firm performance: Evidence from Italian firms. In *Industrial Relations: A Journal of Economy and Society*. 52: 737-764.

Bernardi, L. and Zaccarin, S. (1984). *Indicatori di mobilitá: applicazione di un modello markoviano ai dati della rilevazione trimestrale delle FL.* In Schenkel, M. (a cura di), L'offerta di lavoro in Italia. Venezia: Marsilio.

Bernardi, L. and Zaccarin, S. (1991). *La stima dei flussi e di matrici di transizione*. In U. Trivellato (a cura di), Forze di lavoro: disegno dell'indagine e analisi strutturali. Annali di Statistica, Serie IX, Vol. 11. Roma: ISTAT.

Blumen, I.M.K., and McCarthy, P. (1995). *The Industrial Mobility of Labor as a Probability Process*. Cornell Studies in Industrial and Labor Relations. Vol. 6.

Boeri, T. and Garibaldi, P. (2007). Two tier reforms of employment protection: A honeymoon effect? In *The Economic Journal*. 117: 357-385.

Cirillo, V., Fana, M., and Guarascio, D. (2017). Labour market reforms in Italy: evaluating the effects of the jobs act. In *Economia Politica*. 34: 211-232.

Daruich, D., Di Addario, S., and Saggio, R. (2023). The effects of partial employment protection reforms: Evidence from Italy. In *The Review of Economic Studies*. 90: 2880-2942.

Hoffmann, E.B. and Malacrino, D. (2019). Employment time and the cyclicality of earnings growth. In *Journal of Public Economics*. 169: 160-171.

Marini, C. and Nicolardi, V. (2017). Database del mercato del lavoro a confronto: possibile integrazione per una analisi dinamica dell'occupazione. In *Metodi e analisi statistiche*. 127-149.

Marini, C. and Nicolardi, V. (2018). Livelli e probabilità di transizione del mercato del lavoro: alcune evidenze degli effetti del jobs act sull'occupazione in italia. In *Economia, Istituzioni, Etica e Territorio. Casi di studio ed esperienze a confronto*, 55–78. FrancoAngeli.

Marini, C. and Nicolardi, V. (2021a). Administrative database and official statistics: The case of the real estate analysis. In *Statistica Applicata - Italian Journal of Applied Statistics*. 33: 83-95.

Marini, C. and Nicolardi, V. (2021b). Big data and economic analysis: The challenge of a harmonized database. In P. Mariani and M. Zenga, eds., *Data Science and Social Research II*. Springer International Publishing, Cham: pp 235-246.

Sestito, P. and Viviano, E. (2018). Firing costs and firm hiring: evidence from an Italian reform. In *Economia Politica*. 33: 101-130.

Tealdi, C. (2011). Typical and atypical employment contracts: The case of italy. In *Occasional Papers 39456, Munich Personal RePEc Archive*.

Tomelleri, A. (2021). Temporary jobs and increasing inequality for recent cohotrts in Italy. In *LABIUR*. 35: 500-537.

Ward-Warmedinger, M. and Macchiarelli, C. (2013). Transitions in labour market status in the eu. In *IZA Discussion Papers 7814*. Institute for the Study of Labor (IZA), Bonn.