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THE IMPACT OF THE ACTION PLAN FOR PROMOTING EMPLOYMENT AND COMBATING UNEMPLOYMENT ON EMPLOYMENT INFORMALITY IN ALGERIA

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Abstract

This paper examines whether the Action Plan for Promoting Employment and Combating Unemployment, a labor market intermediation program adopted by the Algerian government in 2008, reduced the informality of employment in Algeria. Using repeated cross-section data from the Household Survey on Employment for the period from 1997 to 2013, and a difference-in-difference methodology, we estimate whether the Action Plan has reduced the probability that workers are employed informally in enterprises of more than 5 workers -- the type of enterprise that is most likely to be directly affected by the Action Plan. Our results show that the Action Plan has in fact contributed to reducing employment informality in such enterprises, but with heterogeneous effects. More precisely, it reduced informality for employees of establishments of 10 workers or more but had no significant effects on informality for those working in enterprises of 5 to 9 workers. Furthermore, when we restrict our estimates to new entrants only, we do not find statistically significant effects.

JEL Classifications: J08, J46, J48, O17

Keywords: Algeria; informal employment; labor market programs.

ملخص

تدرس هذه الورقة ما إذا كانت خطة العمل لتعزيز العمالة ومكافحة البطالة، وهي برنامج وساطة سوق العمل الذي اعتمدته الحكومة الجزائرية في عام 2008، قد خفضت من الطابع غير الرسمي للعمالة في الجزائر. وباستخدام بيانات المقطع العرضي المتكرر من الدراسة الاستقصائية للأسر المعيشية للفترة من 1997 إلى 2013، ومنهجية الاختلاف في الاختلاف، فإننا نقدر ما إذا كانت خطة العمل قد خفضت احتمال توظيف العمال بصورة غير رسمية في مؤسسات تزيد على 5 العمال - نوع المؤسسة التي من المرجح أن تتأثر مباشرة بخطة العمل. وتبين نتائجنا أن خطة العمل ساهمت في الواقع في الحد من العمالة غير الرسمية في هذه المشاريع، ولكن مع آثار غير متجانسة. وبصورة أدق، خفضت العمالة غير الرسمية لموظفي مؤسسات 10 عمال أو أكثر ولكن لم يكن لها أي آثار كبيرة على القطاع غير الرسمي بالنسبة للعاملين في مؤسسات من 5 إلى 9 عمال. وعلاوة على ذلك، عندما نقصر تقديراتنا على الداخلين الجدد فقط، فإننا لا نجد آثارا ذات دلالة إحصائية.

1. Introduction

Algeria experienced a dramatic deterioration in its employment situation following the implementation of the Structural Adjustment Program (SAP) over the 1990-1994 period (CNES 1998). The large increase in the number of new entrants into the labor market associated with the "youth bulge" phenomenon[1], coupled with an increase in female participation, exacerbated the effects of large-scale layoffs from the public sector associated with SAP. These developments triggered a significant increase in unemployment, the growth of the informal economy and the emergence of new forms of more precarious employment. The resulting increase in youth unemployment, especially among graduates, was undoubtedly one of the main contributors to social destabilization and the subsequent political unrest.

In response to the deteriorating employment situation, the Algerian government undertook a number of labor market interventions, which entailed both changes in labor policies as well as in the institutions that implement them. The interventions consist mainly of active labor market programs, such as wage subsidies for new entrants and vocational training programs, as well as passive measures, such as cash assistance for retrenched workers and the unemployed. All these programs attempt to improve the matching of supply and demand in the labor market (Barbier 2007).

Since the end of 1996, Algeria has opted for the aforementioned interventions under the auspices of the Ministry of Labor. Despite these interventions, the unemployment rate in Algeria remained high, albeit on a declining trend. In 2001, the unemployment rate was 26 percent, with 2.3 million unemployed individuals. It began declining in 2002 reaching 15.9 percent, with 1.6 million unemployed individuals, by 2007. This decline remained insufficient in light of the government's target unemployment rate of 10 percent (Ministry of Labor 2008). In addition, much of recent job creation consisted primarily of growth in non-permanent jobs and jobs with definite duration contracts. The growth of formal jobs has been shrinking in the aftermath of the 1990s economic crisis and the informal economy continued to grow. Such growth is due to the inability of the formal sector to create enough jobs for the massive influx of young new entrants onto the labor market.

The share of the informal economy, as defined by the ILO, in the non-agricultural private sector in Algeria increased from 68.5% in 1997 to 72.8% in 2007.[2] According to our estimates, the number of informal workers in the non-agricultural private sector increased from 1.2 to 3.3 million between 1997 and 2007, and up to 3.9 million by 2010, representing a substantial increase in the proportion of informal employment in total employment. Informal employment increased from 21.9% of total employment in 1997 to 43.8% of total employment in 2007. By 2010, it had reached 45.6%.

The Algerian government decided in April 2008 to implement the Action Plan for Promoting Employment and Combating Unemployment (the Action Plan hereafter). Its main axes were promoting youth employment by supporting the development of entrepreneurship and providing incentives for firms to create jobs.

Few studies have focused on assessing the impact of employment policies in Algeria. The National Economic and Social Council (CNES) has conducted several studies assessing employment policies, but these studies did not include a formal impact assessment component (CNES 2002, 2010). The World Bank conducted an assessment but did not assess the policies' impact on labor market outcomes (World Bank 2010). The ILO has also undertaken a comparative analysis of labor market intermediation in the three Maghreb countries (ILO

[1] The average growth rate of the working age population over the 1996-2002 period was 3.4 %. The female labor force participation rate was 9.2 % in 1990 and increased to 17.1% in 2000 (Hammouda and Souag, 2007).

[2] Calculated by authors based on data from the Household Survey of Employment (Enquete Emploi aupres des Menages) implemented by ONS.

2007), and, in 2010, it put together a synthesis of labor market policies for a number of Arab countries, including Algeria. Musette (2014) and Hammouda (2009) evaluated the impact of Algerian labor market policies but drew their conclusions from aggregated data rather than micro econometric analyses. Hammouda and Souag (2007) assessed the impact of policies to enhance labor market flexibility that were introduced as part of the 1990 reforms on business competitiveness. Other studies focused on the measures and determinants of the informal economy in Algeria, including Adair (2002), Bensidoun and Souag (2013), Musette and Charmes (2006), Adair and Bellache (2012), and Hammouda and Souag (2012), but not on policies to reduce informality. In March 2012, the Ministry of Commerce and the *Cercle d'Action et de Reflection Autour de l'Enterprise* (CARE) organized the first symposium on the informal economy in Algeria, entitled "the Transition of the Informal Economy to the Formal Economy", echoed in discussions at the 2014 International Conference of Labour Statisticians (ILO, 2014).

The contribution of this study is to econometrically estimate the impact of the Action Plan on the formalization of jobs in enterprises of 5 workers and more, which we assume are mostly formal. The basic idea according to segmentation theory is that if informal employment in Algeria is not a voluntary choice but is a last resort on the part of labor market participants to escape unemployment. Any program to reduce the cost of hiring in the formal sector , such as the Action Plan, should primarily have an impact in that sector (Souag et al, 2016).

We evaluate the impact on informal employment for existing wage and salary workers and for new entrants into employment. We use cross-sectional data from the Household Survey on Employment conducted by the Algerian National Statistics Office (ONS) for the period 1997-2013. We rely primarily on a Difference in Difference (DID) methodology to examine the impact of the policy. Our identifying assumption is that the policies should contribute to the formalization of employment in formal enterprises (proxied here by enterprises of 5 workers and more), but should not affect the formality status of workers in informal enterprises, i. e., those with less than five employees, since the Action Plan is unlikely to affect the formality of the enterprise itself.[3] We also tried to relax some of the assumptions of the DID estimation by using a local instrumental variables (*LIV*) estimator similar to that proposed by Heckman and Vytlacil (2005), although it proved difficult to find instruments that satisfy the necessary exclusion restrictions in the case of informality.

2. Literature Review

In the economics literature, labor market intermediation is often addressed from a macroeconomic perspective, where the intermediation process is considered as an explanatory factor and is used to explain imbalances in the labor market.[4] It assumes that labor market programs and institutions help match labor supply and demand. In particular, these programs act as countercyclical measures by providing some security provisions for workers (Barbier 2007).

The literature on the evaluation of labor market programs categorizes labor market interventions as either passive or active (Betcherman 2002). Passive programs include income support to compensate workers for the short-term loss associated with the interruption of labor income during unemployment as well as the possible long-term loss associated with having to accept jobs that pay lower wages. Active labor market programs include the provision of employment and job search assistance services, training and retraining, public works, wage subsidies and self-employment assistance (Beckerman et al. 2004). Both active and passive

[3] Wahba and Assaad (2016) use a similar approach to assess the effects of changes in labor regulations on employment informality in Egypt.

[4] Pissarides (1990) evaluated the responsiveness of hiring to the vacancy rate and the unemployment rate, whereas Abraham (1983) focused on unemployment resulting from frictional adjustments rather than insufficient demand.

programs need to be carefully assessed in terms of both their distributional and efficiency effects (Vodopivec 2002, Betcherman 2002). Distribution effects include coverage, adequacy of support, and effects on income distribution. Efficiency effects include the effect on the level of effort expended on job-search, post-unemployment wages, and labor market outcomes, such as employment, unemployment, and labor force participation, as well as the extent of informality in the economy. Other indirect effects include labor supply of other family members, and aggregate output and growth.

The assessment of labor policies is challenging due to the need to design a convincing counterfactual, approximating what would have happened in the absence of the program (Khandker, Koolwal, and Samad, 2010). The method used must allow for the identification of the causal effects of the policy by comparing the treated group to a control that is presumably unaffected by the policy, while taking into account potential selection bias. Among the methods that address the selection bias issue are propensity score matching, which was used to assess U.S. job training programs (Rubin 1977; Rosenbaum and Rubin 1983; Deheija and Wahba 1999, 2002; Heckman, Ichimura and Todd 1997, 1998). Although this non-parametric method offers advantages over regression by loosening functional form assumptions, like regression it assumes that selection into treatment is based only on observables (Ravallion 2008). An alternative approach is to rely on instrumental variables to correct for endogenous selection (Heckman and Vytlacil 2005; and Heckman, Urzua and Vytlacil 2006). However, it is not always easy to find appropriate instruments that satisfy the necessary exogeneity and exclusion restrictions. In the context of employment programs, such instruments should affect participation in the program without directly affecting the outcome variable.

Another method that is sometimes used in program evaluation is regression discontinuity design, which exploits program design features, such as eligibility criteria, to identify discontinuities that can identify the effects of the program (Imbens and Lemieux 2007). The use of this method is limited, however to situations when such design features are present, which is not the case in our application.

Having reviewed the various methods available to correct for selection, we opted for a Difference-in-Difference (DID) estimator. The main identifying assumption underlying this method is that if selection on unobservables is present, it is time-invariant (Ravallion 2008). This assumption suggests that, in the absence of the program, the trend over time in the outcome variables for the treated and control groups should be indistinguishable, and thus any differences in trend across the two groups before and after the treatment can be causally attributed to the treatment. The plausibility of this assumption can be checked if data is available on the relevant outcomes for both treatment and control groups at two points in time prior to treatment. In this falsification test, if no differences in trend can be detected prior to treatment, they would presumably also be absent in the post-treatment period under the no treatment counterfactual (Ravallion 2008). The DID method has been widely used to assess the impact of labor market programs and policies. Heckman and Robb (1985) evaluate the utility of different types of data for the evaluation of training programs and concluded that repeated cross-section data can be used to identify the effects of treatment, subject to certain identifying assumptions. Micco and Pages (2006) exploit time and geographical variation, as well as sector differences across countries to estimate the effects of employment protection legislation on job flows. They conclude that by reducing the size of the most affected industries, labor regulations are likely to curtail firm entry, employment, and value added at the aggregate level. Haltiwanger et al (2006) also use a DID approach to assess the impact of stringent hiring and firing costs on job turnover.

A number of evaluations of labor market programs have been carried in developing country contexts, but mostly in Latin America and the Caribbean. Tan and Lopez Acevedo (2003) use

panel firm-level data to study the determinants of in-firm training in Mexican manufacturing in the 1990s and its effects on productivity and wages. They find that the incidence of training provided by employers became widespread among manufacturing enterprises and a higher share of the workforce received training within firms. Mc Ardle (2006) shows that a substantial amount of firm and workforce training is taking place in the Caribbean region, both inside firms and through publicly financed programs. Betcherman et al (2004) reviewing the overall experience in developing and transition countries examine 49 assessments of training programs primarily targeting the unemployed. They conclude that most subsidy programs do not display net positive impact on the long-term employability or earnings of the participants.

With regards to the Middle East and North Africa, Wahba (2009) examines the impact of employment protection reforms on the formalization of employment in Egypt, finding evidence of positive effects two years after the introduction of the law that introduced the reforms. In order to examine the sustainability of long-term effects, Wahba and Assaad (2016) apply DID methods on longitudinal retrospective data from two surveys. They show that the new labor law did, in fact, increase the probability of transitioning to formal employment for non-contractual workers employed in formal firms.

According to Stampini and Verdier-Chouchane (2011), most of the existing literature on the impact of employment policies in Tunisia adopts a macroeconomic perspective. Marouani (2010) provides a prospective cost-effectiveness analysis of the impact of alternative labor market policies using a dynamic general equilibrium model. The main finding is that a wage subsidy focusing on sectors that are intensive in high skilled labor is more effective than a tax reduction or an investment subsidy in raising employment levels of high-skill labor. Broecke (2013) uses a microeconomic methodology to evaluate Tunisia's largest labor market program, the SIVP: an employment subsidy targeting university graduates. Using a tracer survey of the 2004 graduating cohort and a range of matching techniques, he estimates that the program is poorly targeted and hence not very cost-effective. Belakhal and Mahjoub (2015) estimate the impact of vocational training programs in Tunisia on employment and wages. They use the data issued from a study carried out in Tunisia in 2001 by the Ministry of Vocational Training and Employment on the graduates of national vocational training programs. The estimated model includes three simultaneous equations determining the participation in training, the insertion in the labor market and the wages observed; it shows that job training improves employability and increases potential wages.

Most studies on the impact of vocational training in Morocco used duration models to explore the correlates of post-graduation performance. Montmarquette et al. (1996) find that job search assistance from a formal employment center or from family members, an advanced degree, and successful educational attainment increase the likelihood of employment. Boudarbat (2007) reports that informal activities, job search support, and father's connections accelerate hiring; he also finds that internships are more helpful for women than men. El Aoufi and Bensaïd (2005) shows that vocational training graduates perform worse than their peers, suggesting that this is due to adverse selection into these programs.

3. Background on Algerian Labor Market Policies

Following the fall in oil prices in the mid-1980s and the application of the structural adjustment program (SAP) in the 1990-1994 period, the Algerian labor market experienced a dramatic deterioration. Labor market reforms introduced in the late 1980s allowed for definite duration employment contracts and the possibility of layoffs for economic reasons. Prior to 1997, over 400,000 jobs were destroyed; economic growth turned negative (from 1.2% in 1991 to -2% in 1993 and -0.7% in 1994), inflation reached double-digit levels (29.8% in 1995) business investment weakened, especially in the agricultural and construction industries. Foreign exchange reserves were depleted reaching $2.1 billion in 1995. All these factors, coupled with

deteriorating security, affected the level of job creation and resulted in a very high unemployment rate (26.4 % in 1997).

3.1. Period 1: 1997-2007

The Algerian government introduced various programs, particularly targeting youth, with the objective of reducing unemployment in the short term. These programs included recruitment incentives for businesses, support to entrepreneurship and public works programs at the community level. In this study, we focus only on programs directly targeting job creation.

3.1.1 Incentives to businesses for job creation

The Local Initiative for Wage Workers (ESIL) provided unemployed young people with skills training and basic experience to increase their chances of finding a job. This program was designed to employ first-time job seekers among young people with low levels of educational attainment for a period not exceeding one year. The remuneration of ESIL increased in nominal terms, from 1,800 dinars per month in 1990 to 2,500 dinars per month in 2004. The Pre-Employment Contract (CPE), a program specifically targeting educated young people, among whom unemployment was generally very high, was implemented in 1998. This program enabled businesses to employ these educated youths at no cost or at a reduced cost since they were paid a compensation equal to the national minimum wage directly by the State.

3.1.2 Public measures to fight poverty

Two other publicly-funded initiatives have included active labor market provisions: (i) the Allowance for Public Works (IAIG), which remunerates community service activities, such as reforestation, and (ii) Labor-Intensive Public Utilities (TUPHIMO), which was launched in 1997. Although it is regarded as an active labor market program, it is also an anti-poverty program because it leads to the rapid creation of temporary jobs.

3.2 Period 2: Post-2008

After 2008, economic conditions improved and economic growth resumed (5% per annum, on average, throughout the period) and inflation remained under control averaging 2.5% per annum. The unemployment rate had dropped from 29.3 percent in 1999 to 15.9 percent in 2007. However, there were still over one million unemployed individuals in 2007, 70 percent of whom were new entrants to the labor market seeking their first job. This is addition to the roughly 300,000 new job seekers joining the Algerian labor force every year. The government decided in April 2008 to implement the Action Plan for the Promotion of Employment and Combating Unemployment that includes several components we discuss in detail below.

3.2.1 Promoting youth employment

Young people constitute over 70 percent of the population in search of employment, among which there is an average of 120,000 graduates per annum (Ministry of Labor 2008). Hence, a new mechanism was designed to address the needs of unemployed graduates.

The National Employment Agency (ANEM) manages the new program called the *Dispositif d'Aide a l'Insertion Professionnelle* (DAIP), which is designed to assist young new entrants to find jobs, as described in Table 1... In addition, the Ministry of National Solidarity administers a social inclusion program described in detail in Table 2.

3.2.2 Incentives for enterprises engaged in job creation

In addition to the incentives provided by the two programs described above, enterprises receive additional incentives for retaining workers after the introductory period. The benefits include:

1. Reduction of social security contributions (20%, 28% or 36%). It is granted under law No. 06-21 of December the 11th 2006 on incentives and support for the promotion of employment. The State budget provides the balance of the contributions not covered by

the National Unemployment Insurance Fund (CNAC) to reach full exemption for employers.[5]

2. Reduction of social security contributions for one year for non-employees to master artisans who are recruited after the introductory period. The differential contribution is funded by the state budget.
3. Reducing the income tax (IRG) and taxes on corporate profits (IBS) for four years (act 59 of the 2007 law of finance). For the master artisans, the rate reaches a very low level.
4. Extending IBS exemption period from three to five years for companies creating 50 to 100 jobs and up to seven years for those creating more than 100 jobs.

4. Econometric Model

We are interested in examining the effect of the Action Plan on reducing the probability that workers are informally-employed in formal enterprises. We conduct our test for two categories of workers: all wage workers and new entrants into wage work. The main idea behind our identification strategy, is that the Action Plan will likely only affect the formality status of workers in formal establishments (which we proxy by establishments that have 5 or more workers). The formality status of those in small establishments (1-4 workers) is essentially determined by the legal status of the enterprise itself, which is not likely to be affected by the Action Plan. We thus consider two treatment groups, workers in establishment of 5-9 workers and workers in establishments of 10 or more workers. Our control group is made up of workers in establishments of fewer than 5 workers. For all three groups, we compare the proportion in informal jobs before and after the introduction of the Action Plan.

Let Y_i be the outcome indicator. Thus, $Y_i = 1$ if individual i has an informal job and 0 if the job is formal, for any $i = 1, \dots\dots, n$.

The treatment dummy variable T_i=1 if the worker is an enterprise of 5 workers of more (or 10 workers or more in another version of the model), T_i=0, otherwise. By defining the treatment variable in this way, we are assuming that the employment status of workers in very small, probably informal enterprises is unlikely to be affected by the Action Plan since the action plan is unlikely to change the formality status of the enterprise. On the other hand, larger, presumably formal enterprises, will have an incentive to formalize the status of their workers in order to take advantage of the wage subsidies and social insurance premium reductions afforded by the Action Plan. We also define a dummy variable *Post*, which takes on the value of 1 for the period after the implementation of the Action Plan, 2008 to 2013 (the last date for which we have data) and 0 for the period prior to its implementation: 1997-2007.

To identify the effect of the Action Plan on the formality status of workers, we estimate the following logit regression.

$$\Pr(Y_{it} = 1) = F\,(\alpha + \beta T_i\, Post + \gamma T_i + \delta Post + \lambda X_i),\ (Post = 0,1\ ; i = 1, \dots\dots\dots, n) \quad (1)$$

Where: F is the logit cumulative function. According to our DID setup, the effect of the program on the outcome is captured by the coefficient of the interaction between treatment variable T_i and the *Post* dummy (β). The coefficient γ captures time invariant selection effects and the coefficient δ captures time effects, which are assumed to be independent of the treatment, under our identifying assumptions. X is a matrix of co-variates and λ is a vector of their coefficients.

[5]Table A1 in the appendix shows the distribution of social security contributions in Algeria.

5. Data and Empirical Specification

In this analysis, we use repeated cross section data derived from the official household survey of employment, conducted on a regular basis by the ONS. We have data from 1997 to 2013. The sample consists of a stratified random sample of households drawn from the population and housing census (RGPH) carried out every 10 years. The purpose of this survey is to provide statistics on employment and unemployment, but it contains no information on income. From 1998 to 2000, the household survey on employment was not conducted because the resources of the statistical office were directed towards the implementation of the population census in 1998 and the income and expenditure survey in 2000. Implementation of the household survey on employment resumed in 2001 and has been conducted annually since then. Our data extends to 2013.

Informal jobs are identified from the characteristics of employment, following the statistical definition of informal employment approved in 2003 at the 17th International Conference of Labor Statisticians (ILO, 2003). Accordingly, the criterion of non-affiliation to social insurance is used to identify informal workers. In this paper, we focus exclusively on wage and salary workers and therefore exclude non-wage workers from the analysis. The analysis also excludes agricultural workers as recommended by the international experts of the Delhi Group on Informal Sector Statistics. Furthermore, we only include the private sector, since all workers in the public sector, are likely to be registered with the social insurance system (Bensidoun and Souag 2013).

As mentioned above, we consider a worker treated if they are employed by a formal firm. Since we do not directly observe the registration status of enterprises in the employee data, we assume that registration is closely linked to the size of the enterprise. Hence, we follow the recommendations of the 15th International Conference of Labor Statisticians (ILO, 1993) and use size as a way to identify formal enterprises. Specifically, we consider all the enterprises with at least five employees as formal and those with less than five employees as informal. We further subdivide formal enterprise into two groups: those with five to nine workers and those with at least 10 workers. The treatment variable in our model is being employed by a formal enterprise. We operationalize this as two separate treatments, one is being in an enterprise of 5-9 workers and one as being in an enterprise of 10 workers or more, the control group being workers in enterprises of fewer than 5 workers

We conduct separate analyses for all private non-agricultural wage and salary workers and for new entrants among such workers, meaning workers who were not working in the year prior to the survey, but are observed as private non-agricultural wage and salary workers in the survey year. Because specific provisions of the plan provide incentives to employers to hire new workers, there is reason to believe that new workers may be affected differently by the Action Plan. However, it should be kept in mind that the sample of all private wage and salary workers is likely to be much larger than that of new workers, which would limit the power of our test for the latter.

To test the soundness of our identification assumption, we conduct a falsification test whereby we apply the DID estimator to two sub-periods within the 'before' period. This is in effect a test of the equal trends assumptions for the treated and control groups in the period prior to the Action Plan. We conduct this test for the period from 2001 to 2007, arbitrarily choosing various cutoff years in between.

6. Results

6.1. Descriptive results

We first present the trend of employment by institutional sector over the 2001-2013 period using cross sectional data. Figure 1 shows that the share of informal employment in total wage

and salary employment excluding agriculture has increased by 9.1 percentage points between 2001 and 2010. Over this period, public sector jobs made up approximately 70 percent of formal jobs. Thus, most of the decline in formality is due to the decline in public sector employment, whose share fell by 10 percentage points during this period. The withdrawal of the State from the economy did not result in a commensurate increase formal private employment, leading to the observed informalization of the labor market. From 2010 to 2013, this informalization trend has reversed somewhat, mostly as a result of the resumption of hiring in the public sector.

In Figures 2, we focus on the formality status of all private wage and salary workers outside of agriculture. We examine the percent informal by the size category of the enterprise in which they work over time. As expected, the share of informal jobs among workers in enterprises of fewer than 5 workers is very high at almost 90 percent and remains at that level throughout the period under consideration. The informal share among workers in enterprises of 5-9 workers is also high, ranging between 80 and 85 percent and does not exhibit any particular trend over the same period. The informal share among workers in enterprises of 10 workers and more increases from about 40 percent to sixty percent from 2001 to 2008, declines sharply to about 45 percent in 2009, but recovers to increase again to nearly 60 percent by 2012. While the sharp increasing trend of informality appears to have been interrupted by the introduction of the action plan in 2008, the descriptive data is inconclusive on whether the decline in informality was sustained. From 2001 to 2007, the informal share among new employees

Figure 3 shows the same information but for new employees, meaning those who were not working in the year prior to the survey year, but are observed to be private non-agricultural wage workers in the survey year.[6]As for all employees, informality is almost universal among new employees in enterprises of fewer than 5 workers, ranging between 90 and 100 percent in most years. The share among new employees in enterprises of 5-9 workers starts off lower at about 80 percent in 2001, but rises to nearly 90 percent by 2007, and then fluctuates between 80 and 90 percent thereafter. The informal share of new employees in enterprises of 10 or more workers is much lower, about just over 50 percent in the early 2000s, rises sharply to 75 percent by 2007 and then drops to below 50 percent by 2009. After 2009, the share informal among new workers in larger enterprises rises again, but settles somewhere around 55 percent by the end of the period under consideration. Again, there appears to be some evidence that the rapid rise in informality may have been interrupted by the introduction of the Action Plan, but here again, there is some question as to the sustainability of this change.

6.2. Difference in difference estimation

We now discuss our DID results shown in Table 3. As discussed earlier, we estimate separate models for all private non-agricultural wage and salary workers and new workers in that group. We have two separate treatment variables, the first is belonging to an enterprise of 5-9 workers and the second is belonging to an enterprise of 10 workers and more. Each of these treatments is interacted with the *Post* dummy, to give us our two DID effects, which under our identifying assumptions identify the effect of the Action Plan on the informality of employment. We estimate four different models, each with a broader set of controls. The first is the DID model shown in equation (1) without covariates. The second model controls for the gender, age, age squared, and educational attainment. The third model includes the industry of employment (specified at the 1-digit ISIC level) in addition to the previously included variables. The fourth model adds a linear time trend and some conjectural variables such as real GDP growth rate and unemployment rate.

[6] This information is obtained from a retrospective question about employment status in the previous year, which is asked of all individuals in the survey.

Starting with the results all workers in the top panel of Table 3, we can see from the coefficient of the "Post" dummy that informality in the control group increases significantly after the introduction of the Action Plan, and that this increase becomes larger as more covariates are included. We can also see from the coefficient of the treatment 1 and treatment 2 dummies that informality of employment is significantly lower in firms of 5-9 workers and even more so in firms of 10+ employees. The DID terms show that the Action Plan did indeed reduce informality in treated firms, but the results are only statistically significant for Model 2 in the case of the 5-9 worker treatment variable, and for all models in the case of the 10+ worker treatment variable.

For the case of new employees, the period effects are not as clear. In some models, informality is reduced after the introduction of the Action Plan and, in other models, it is increased. In all cases, however, informality is much lower in both the 5-9 and the 10+ size categories compared to the less than five worker category. However, the DID terms indicate that the action plan had no discernible effect on the formality of employment of new employees. In fact, the model without covariates shows a marginally significant *positive* effect of the Action Plan on the informality of workers employed in firms with 5-9 workers compared to smaller firms, but this effect becomes insignificant with the addition of more controls. All the DID terms are insignificant in the case of the 10+ treatment variable. We can, therefore, conclude that the Action Plan resulted in existing employees becoming formalized to take advantage of the employment subsidies provided by the action plan, but that employers may still be reluctant to hire new employees formally until they have had a chance to observe their performance.

To check on the soundness of our identifying assumption, we carry out a falsification test by applying the DID methodology only to the period preceding the introduction of the Action Plan, namely, 2001 to 2007. The results are shown in Table A2 in the Appendix. We arbitrarily select 2003as the threshold year for pre and post analysis. As seen in Table A2, none of the DID terms are significant for either of the treatment terms. This suggests that the treatment and control groups had similar pre-treatment trends, lending credibility to our identification assumption.

7. Conclusion

The core of employment policy in Algeria has been the implementation of active labor market programs by various public agencies. Each agency runs different programs and has access to a substantial amount of resources. Despite the large investment of resources into these programs, there is limited information regarding their effectiveness. For example, little is known about the number of beneficiaries and the dropout rates. There is no follow-up of beneficiaries and no assessment of the effectiveness of the policies in terms of job placement rates, impact on duration of unemployment and quality of employment.

The objective of this paper is to evaluate the impact of the Action Plan adopted by the Algerian government in 2008, which is the second major intervention in the labor market in Algeria, the first dating back to 1997. Using repeated cross section data from 1997 to 2013 and a DID estimator, we estimate the impact of the introduction of the Action Plan on the formality of employment for private non-agricultural wage and salary workers. Our results show that the Action Plan did, in fact, reduce the probability that workers are employed informally, but only in enterprises with at least 10 workers. In spite of the existence of various incentives for the recruitment of new job-seekers, the impact of the plan on newly recruited workers proved statistically insignificant. Although this may be due to the relatively small sample size of these new entrants, the point estimates are small and often with the wrong sign. This suggests that employers are not ready to offer formal jobs immediately to new employees, despite incentives to do so, but that they are willing to formalize employees, once they have observed their job performance for some time.

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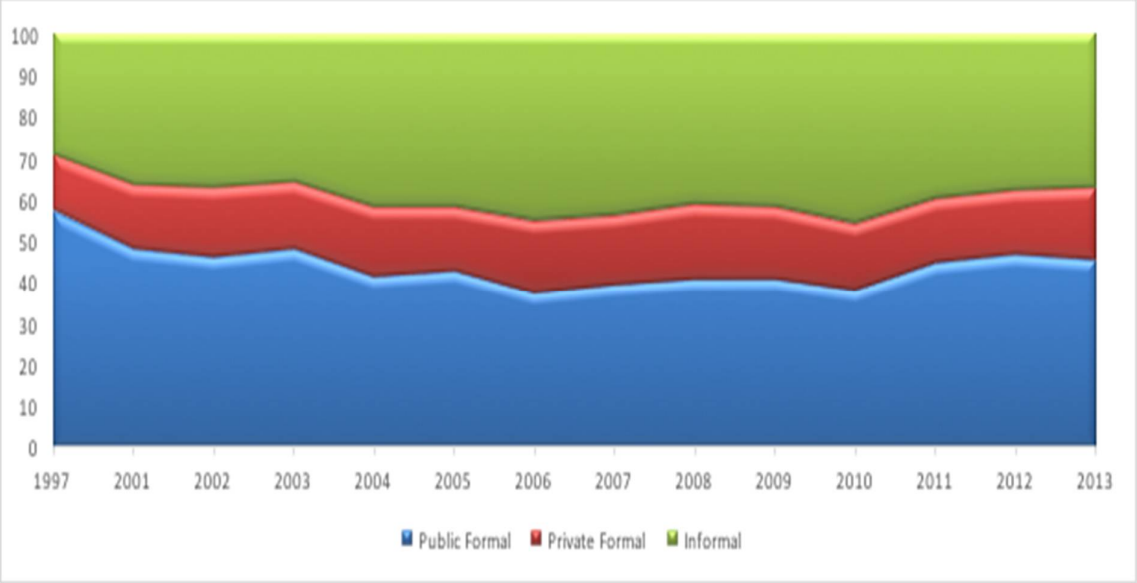
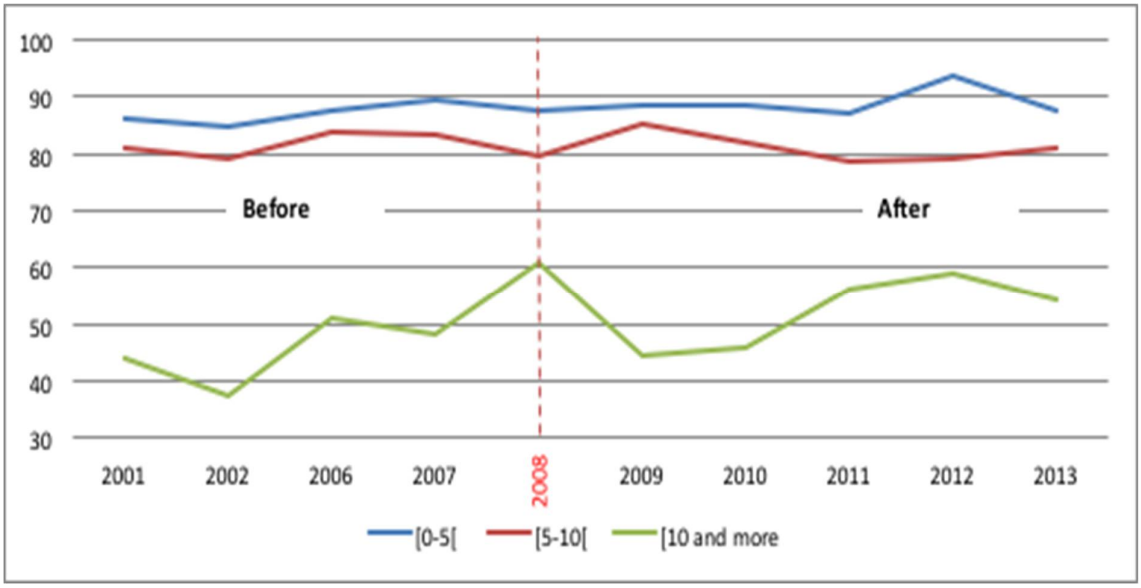
Figure 1: Distribution of Employment Outside Agriculture in Algeria by Formality Status and Sector,1997-2013 (percentage)



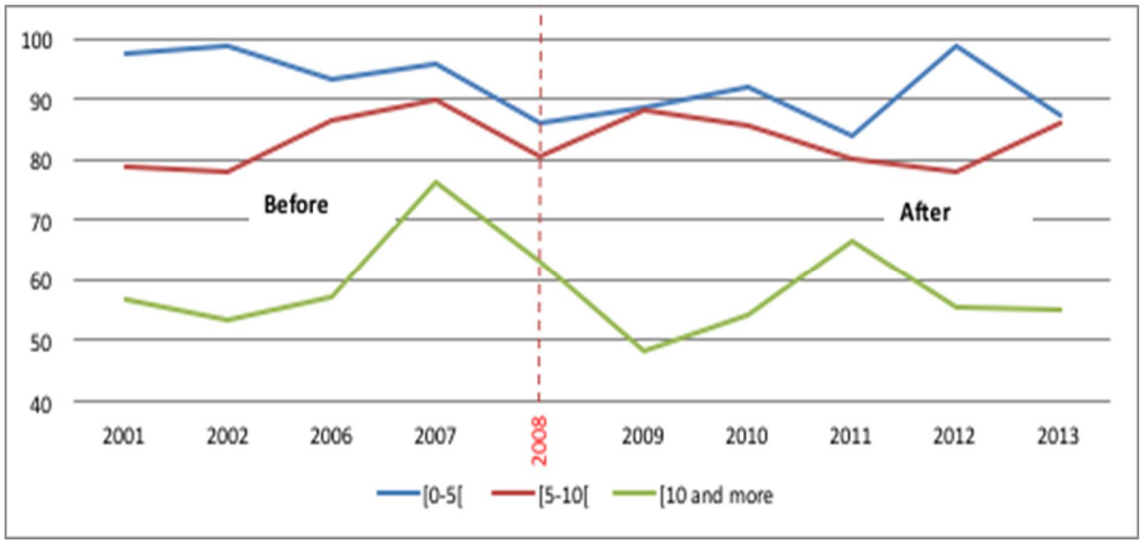
Source: authors' calculation using ONS data from the Household Survey on Employment.

Figure 2: Percent Informal Among Private Wage and Salary Workers Outside Agriculture by Size of Enterprise (percentage)



Source: authors' calculation using ONS data from the Household Survey on Employment.

Figure 3: Percent Informal Among New Private Wage and Salary Workers Outside Agriculture (Percentage)



Note: New workers are defined as workers who were not employed in the previous year but were wage and salary workers in the current year.
Source: authors' calculation using ONS data from the Household Survey on Employment.

Table 1: Active Labor Market Programs

Program	Nature	Duration	Compensation	Comment
DAIP (vocational integration assistance mechanism for young people), run by the Ministry of Labour, Employment and Social Security, consists of three distinct categories :				
Graduate integration contract (CID)	Intended for first-time jobseekers, graduates of tertiary education or senior technicians who receive support for their sustainable recruitment, priority within public and private economic sector	Economic enterprises: 1 year Administration: 1.5 year	University graduates: DZD 15 000 per month Senior technicians: DZD 10 000 per month The employer's contribution to social security is paid by the state.	This measure replaces the pre-employment contract for graduates (CPE).
Professional integration contract (CIP)	Aimed at young, first-time jobseekers leaving secondary education or vocational education and training (VET) centers (CFPA) (including apprentices)	Firms: 1 year, nonrenewable Public administration: 1 year, renewable	In firms: DZD 8 000 per month In public administration: DZD 6 000 per month The employer's share of contributions to social security is covered by the state.	At the end of the CIP contract ANEM may propose a subsidised work contract (CTA) in firms. In case of refusal, the person loses the right to remain in the CIP.
Training insertion contract (CFI)	Targets young jobseekers without training or qualifications; they are placed either in various work projects initiated by local authorities or by different sectors for the duration of the project	1 year, non-renewable	Bursaries: DZD 4 000 per month during their training if they are working with craftsmen and the equivalent of the wage paid for the position occupied if the young person is placed in a particular project (the laws and regulations in force are applicable in this case)	
Subsidised work contract (CTA)	Is proposed when one of the contracts cited above comes to an end (and sometimes earlier if the employer agrees)	3 years	Labor costs shared between government and employer:	

Source: Reproduced as is from Musette (2014, p. 15).

Table 2: Social Inclusion Programs

Program	Nature	Duration	Compensation	Comment
Social inclusion programs developed by the Ministry of National Solidarity are designed to fight poverty and youth unemployment. They are part of a social treatment of unemployment and are managed by the social Development Agency (ADS) at national level and implemented locally by the Department of Social Action at *wilaya* level (DAS).				
Insertion program for graduates (PID)	Targets young university graduates and technicians without income, in precarious situations or with disabilities. Second criterion: youth aged 19-35 with no income.	1 year, renewable once	University graduates: DZD 10 000 per month Technicians: DZD 8 000 per month + social insurance paid by the state	
Allowance for activity or community service (AIG)	Its objective is the social inclusion of disadvantaged people who are active and of employable age. It addresses the social categories that have no income.	1 year, renewable, but can be permanent in specific local circumstances	DZD 3 000 per month + social insurance paid by the state	
Social inclusion programs (DAIS) replace a local initiative for wage workers (ESIL) and compensation for workers engaged in community-based activities (IAIG)	Aims to place unemployed, unskilled 18-59 in temporary positions in the private or public sector.	2 years, renewable twice	DZD 6 000 per month + social insurance paid by the state	ESIL is integrated under this new label. IAIG is also integrated under this label since March 2012.

Source: Reproduced as is from Musette (2014, p. 16).

Table 3: Coefficients from a Probit Model of the Probability of being in an Informal Job, Private Non-Agricultural Wage and Salary Workers 2001- 2013

		5-9 workers		10 workers and more	
	Post	**Treatment 1**	**DID 1**	**Treatment 2**	**DID 2**
			All Private Non-Agricultural Wage & Salary Workers		
Model 1: No covariates	0.101***	-0.551***	-0.083	-2.012***	**-0.087***
	(0.038)	(0.049)	(0.063)	(0.039)	(0.051)
Model 2: includes individual characteristics	0.546***	-0.554***	**-0.143****	-1.863***	**-0.185*****
	(0.040)	(0.053)	(0.068)	(0.043)	(0.056)
Model 3: adds industry dummies to Model 2	0.488***	-0.801***	-0.089	-2.104***	**-0.221*****
	(0.041)	(0.055)	(0.070)	(0.046)	(0.058)
Model 4: adds time trend and conjectural variables to Model 3	2.098***	-0.789***	-0.107	-2.188***	**-0.162*****
	(0.077)	(0.058)	(0.072)	(0.049)	(0.060)
			New Private Non-Agricultural Wage & Salary Workers		
Model 1: No covariates	-0.430**	-0.987***	**0.583***	-2.108***	0.085
	(0.195)	(0.286)	(0.326)	(0.228)	(0.261)
Model 2: includes individual characteristics	-0.164	-0.712**	0.268	-1.883***	-0.2
	(0.203)	(0.301)	(0.343)	(0.241)	(0.277)
Model 3: adds industry dummies to Model 2	-0.232	-0.798**	0.254	-1.929***	-0.289
	(0.205)	(0.312)	(0.353)	(0.250)	(0.284)
Model 4: adds time trend and conjectural variables to Model 3	1.425***	-0.973***	0.441	-2.132***	-0.049
	(0.402)	(0.330)	(0.370)	(0.269)	(0.300)

Notes: * p<0.10, ** p<0.05, *** p<0.01. The outcome is the probability to get an informal job. N for All employees = 55,079 : N for New employees = 3,163. Authors' estimates based on data from the Household Survey of Employment (ONS).

Appendix

Table A1: Distribution of Social Security Contribution

Branches	Share of employer	Share of employee	Share of social fund	Total
Social Security	11.50%	1.50%	---	13.00%
Work accidents and professional diseases	1.25%	---	---	1.25%
Retirement	11 %	6..75%	0.005	0.1825
Unemployment Security	1%	1%	---	2%
Early retirement	0.25%	0.25%	---	0.50%
Total	25%	9%	1%	35%

Source: Executive Decree No 15-236 of 03-09-2015 modifying the Executive Decree No 94-184 of 06/07/1994.

Social contributions for the self-employed amount to 15%, equally divided (7.5%) between social insurance and retirement calculated upon annual taxable income (from 216,000 to 1,728,000 DA).

Table A2: Falsification Test: Probability to Get an Informal Job (2001-2007)

	[5-10 [workers			At least 10 workers		
	Post	Treatment	DID	Post	Treatment	DID
			New Employees			
Model 1: Basic	0.332***	-0.423***	-0.117	0.332***	-2.183***	0.021
	(0.076)	(0.119)	(0.137)	(0.076)	(0.094)	(0.107)
Model 2: including individual characteristics	0.428***	-0.434***	-0.123	0.428***	-2.001***	-0.015
	(0.080)	(0.125)	(0.144)	(0.080)	(0.100)	(0.114)
Model 3: including industry	0.447***	-0.735***	-0.1	0.447***	-2.260***	-0.027
	(0.081)	(0.131)	(0.149)	(0.081)	(0.107)	(0.118)
Model 4: including trend	0.898***	-0.739***	-0.097	0.898***	-2.269***	-0.021
	(0.274)	(0.131)	(0.149)	(0.274)	(0.107)	(0.119)
			New Employee			
Model 1: Basic	-0.559	-1.875**	0.833	-0.559	-3.091***	0.929
	(0.638)	(0.741)	(0.842)	(0.638)	(0.665)	(0.735)
Model 2: including individual characteristics	-0.42	-1.754**	0.799	-0.42	-2.754***	0.606
	(0.644)	(0.755)	(0.858)	(0.644)	(0.680)	(0.752)
Model 3: including industry	-0.471	-2.188***	1.089	-0.471	-2.929***	0.664
	(0.651)	(0.793)	(0.887)	(0.651)	(0.705)	(0.778)
Model 4: including trend + conjectural variables	-0.904	-2.241***	1.068	-0.904	-2.952***	0.613
	(1.567)	(0.797)	(0.891)	(1.567)	(0.706)	(0.781)

Notes: * p<0.10, ** p<0.05, *** p<0.01, outcome is the probability to get an informal job. N for All employees = 16,061: N for New employees = 674. Source: authors from the ONS databases.

Table A3: Descriptive Statistic Before and After the Plan

	Before	After	Total
Education			
Without diploma	15.4	12.7	14.9
Primary school	23.5	21.1	23
Intermediate	36.2	41.2	37.2
Secondary school	18.8	18.9	18.8
University	6.1	6.2	6.1
Total	100	100	100
Gender			
Male	86.5	86.7	86.6
Female	13.5	13.3	13.4
Age			
Total	100	100	100
Age (Mean)	34.172	35.011	---
Situation in the profession			
Self-employment	46.7	44.3	46.2
Employee	53.3	55.7	53.8
Total	100	100	100
Industry			
Extractive industries	0.7*	1*	0.8*
Manufacturing	17.9	16.6	17.6
Electricity, Gas and Water	0.3*	0.5*	0.3*
Construction	27.2	34.1	28.5
Trade, Hotels and Restaurants	34.5	30	33.6
Transport and Communication	9.6	7.8	9.3
Financial and Real Estate	0.4	0.3	0.4
Other services	9.5	9.8	9.5
Total	100	100	100
Social security affiliation			
Yes	27.8	25.8	27.4
No	72.2	74.2	72.6
Total	100	100	100
Size of enterprises			
[0-4]	77	67.5	74.7
[5-9]	9.8	12.9	10.6
[10 and + more	13.2	19.6	14.8
Total			
Administrative registration			
Yes	41.1	39.4	40.7
No	58.9	60.6	59.3
Total	100	100	100
Tax registration			
Yes	40.6	42.5	41
No	59.4	57.5	59
Total	100	100	100

Notes: * All the absolute frequencies are over 40. Source: authors from the ONS databases.