working paper
2017-10

Evidence of the impacts of minimum wages on labor market outcomes: The case of Bolivia

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February 2017

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PAGE policy analysis on growth and employment

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Abstract

Economic theory suggests that minimum wages may lead to unemployment; nevertheless, empirical evidence in developed economies stays ambiguous. Evidence from developing countries is even more heterogenous due to the low law enforcement and weaker labor market institutions. Thus, our aim is to assess the impact of minimum wage increases on labor market outcomes in Bolivia, a country characterized by weak law compliance and high informality. Our identification strategy exploits differences in exposure to minimum wage increases across subsets of population for the period 2006-2013. Our results show positive and significant effects over real wages for men with no effects on employment, informalization or hours worked. Furthermore, we find evidence of gender discrimination since women are prone to suffer unemployment and informalization while not benefiting from higher real wages as men do.

JEL codes: J3, J4
Key words: Minimum wage, unemployment, informal employment

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Acknowledgements

This work was carried out with financial and scientific support from the Partnership for Economic Policy (PEP), with funding from the Department for International Development (DFID) of the United Kingdom (or UK Aid), and the Government of Canada through the International Development Research Center (IDRC).

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I. Introduction

The minimum wage (MW) remains one of the most controversial issues in labor economics, economic policy, and politics. On the one hand, a minimum wage provides a sufficient income for full-time workers to acquire essential goods and services, with evidence showing that increases in legal minimum wage help workers to move out of poverty (Alaniz, Gindling & Terrell, 2011). Furthermore, it prevents employers with dominant market positions from taking advantage of certain vulnerable employees like women, low-qualified workers, the long-term unemployed and individuals with little or no work experience. On the other hand, the existence of a minimum wage could discourage employers from hiring workers covered by the current MW (minimum wage) legislation, and therefore, lead to the unemployment of vulnerable groups placed at the left-tail of the wage distribution (Lee & Saez, 2008).

Even though minimum wage impacts on labor market outcomes have been widely studied in the context of developed economies where MW is binding (Neumark & Wascher, 2006), there is less and more heterogenous evidence for developing economies characterized by non-compliance. Thus, findings by Maloney and Nuñez (2004) for Latin American countries, Lemos (2004) for Brazil, Dinkelman and Ranchhod (2012) for South Africa and Canelas (2014) for Ecuador, to cite just a few, point to a lack of consensus on the effects of such policy which in turn emphasizes the need for country specific evidence on a wider set of outcomes such as informality.

Among Latin-American countries, Bolivia's labour market is particularly interesting due to its active MW policy and weak law enforcement. Bolivia's real minimum wage has risen systematically as a result of the socio-economic plan implemented by its president Evo Morales since he took office in 2006. Thus, our first contribution provides evidence of the minimum wage effects in Bolivia, a country that to the best of our knowledge has not yet been studied by the international literature.

Our empirical analysis builds on a pool of yearly Household Surveys ranging from 2005 to 2013, thus, our second contribution relates to the econometric identification strategy which stands on two pillars: first, the definition of an artificial pseudo-individual (cell) characterized by a specific exposure to the MW raise and second, controlling of a parallel government labor market intervention aiming to keep real wages constant. The robustness of our findings is validated by exploiting regional differences in the exposure to treatment across Bolivia's nine departments as in Dinkelman and Ranchhod (2012). The MW raise effects are assessed through key labor market outcomes such as, wages, unemployment, intensive (hours of work) and extensive margins (formality, informality and self-employment).

Among our main findings we see that the 2006 MW rise, which was the first year of the policy shift, had positive significant effects on men's real wages with non-significative effects on either unemployment or intensive margins (hours worked). This counterintuitive effect on employment may be the result of a market characterizied by a monopsonistic competition structure as suggested by Bhaskar, Manning and To (2002). Women's real wages, however, did not exhibit a significant increase. For the remaining years, we continue to find positive and significant effects on men's real wages and that women do not benefit as much as men do. Furthermore, we find evidence of a gender gap in favor of men, as the quality of women's employment tends to deteriorate as MW rise.

The paper is organized as follows: the following section (2) places our study in the existing literature; section 3 provides the labor market context of Bolivian minimum wage; section 4 describes the data employed in our analysis while section 5 develops the methodological approach and presents the results. Finally, section 6 concludes and provides brief policy implications.

II. Literature Review

Identifying the impact of minimum wage on labor market outcomes has been a topic of interest in labor economics for several years. The existing literature varies on its findings of the impact of minimum wage on employment. Neumark and Wascher (2006) provide a review of the findings in minimum wage literature for the United States and other countries. They point out that most of the studies find negative but not always statistically significant unemployment effects. On the other hand, the seminal paper of Card and Krueger (1994) found no evidence of an unemployment effect in New Jersey fast-food restaurants. Along the same line of research, Card (1992) found no evidence of a reduction of teenagers' employment due to an increase in federal minimum wage either. Authors argue that what may explain the lack of unemployment effects is firms' financial flexibility to cover the higher labor costs, that is, that firms often pay wages below workers' marginal productivity value before the MW policy intervention.

This lack of consensus has promoted incentives to consider alternative mechanisms through which the minimum wage could affect the labor market. For instance, Zavodny (2000) among others suggests that employers could adjust by demanding less hours rather than cutting employment. However, she does not find conclusive evidence of her hypothesis on teen employment in the US.

The empirical approaches of this literature mostly consist of exploiting natural experiments to identify the causal effect of minimum wage over labor market outcomes. Card (1992) measured the exposure to the federal minimum wage using the fraction of individuals affected by the 1990 federal minimum wage increase. More recently, Clemens and Whitaker (2014) took advantage of changes in the United States' federal minimum wage between 2007 and 2009 to create two groups of states; bounded and unbounded states by the federal minimum wage, in order to assess its effect on employment during the crisis and found that minimum wage had negative impacts on employment.

Most of the available international literature has focused on countries where law compliance is high and the MW is binding across the whole labor market. This raises new questions regarding labor markets characterized by little law enforcement where informality could be another escape valve to MW presures. Latin-American labor markets are characterized by the presence of two kinds of employment: a covered formal employment with entitlement to social benefits and an uncovered informal employment which does not. Informality in developing countries has been characterized as large and fragmented, with a vast array of people and economic activities, including home-based work, street vendors, entrepreneurs who employ other workers and self-employed people.

In this Latin-American context, the standard two sector labor market model (Harris & Todaro, 1970; Mincer, 1976) predicts that an increase in minimum wage will increase salaries and decrease employment in the formal sector. Furthermore, among those who lose their jobs, some will stay unemployed waiting for formal sector jobs while others will switch to informal ones, where according to the model, wages are supposed to be in a competitive equilibrium. This flow of workers across sectors will cause a decrease in salaries and an increase in employment in the informal sector. However, such theoretical prediction is not supported by the Latin-American evidence in Maloney and Nuñez (2004), Lemos (2004) and Khamis (2008). On the contrary, they show that MW can increase salaries in the informal sector as well, through a lighthouse effect. The latter occurs when the MW set in the formal sector is taken as a reference price (index), a signal for bargaining, throughout the economy at large. Thus, this motivates the analysis of both formal and informal sector outcomes (wage and employment) in countries such as Bolvia, characterized by weak law enforcement and high informality.

The econometric identification of MW effects has come from natural experiments where there has been an unexpected exogenous intervention, or where the exposure to treatment may be considered random. For instance, Dinkelman and Ranchhod (2012) took advantage of a new legislation directed to set the first national minimum wage for domestic workers in South Africa, a country where informal employment exists either in the form of non-signed contracts, or as a lack of social benefits. Since the new legislation defined the same wage floor for the whole country at the same time, they defined an exposure to treatment variable – the wage gap – (calculated as the difference between the new minimum wage and the median wage in each region). By using a difference in differences approach, they measured the MW effects on wages, worked hours and employment status. Their findings suggest that the introduction of the MW law created incentives that triggered the formalization of informal jobs; moreover, they found positive effects on salaries and no unemployment effects.

Canelas (2014) took advantage of regional variability of the exposure to treatment (MW raise) in Ecuador, a scenario of weak law enforcement similar to Bolivia's. Using a fraction affected proxy of the probability of being treated, she found no MW effects on employment or wages. She attributes this lack of impact to the large non-compliance of minimum wage. This lack of effect on employment could also be explained by imperfect competition in the labor market, characterized by the existence of firms' market power. As Bhaskar, Manning and To (2002) showed, if a market structure is characterized by monosopsonistic competition, a MW policy will have two effects on employment: 1) in a monpsonistic competition, firms will hire less workers than in a competitive setting, so an increase in MW will also increase employment; 2) an increase in MW will force some firms out of the market, leading to a decrease in employment. In summary, if the first effect is greater than the second, a MW policy will have positive effects on employment. In the same manner, if these countervailing effects are the same, the MW policy will have no effects on unemployment.

In this non-competitive scenario, something that is surprising, and that is important for a country like Bolivia, is the result obtained by Basu, Chau and Kanbur (2010) who found that a complete MW enforcement is not necessary for producing positive effects on employment if the new MW does not exceed a certain threshold.

Our contribution builds on this literature as we aim to identify the potential effects of minimum wage increases not only on wages and employment but also on other potential adjustment mechanisms, such as informality, self-employment and hours worked. In order to overcome a set of difficulties in the identification of the minimum wage effect, we provide a similar empirical approach to Card (1992), Dinkelman and Ranchhod (2012) and Canelas (2014), and take advantage of the variability in states' exposure. This research is an extension of the existing literature since we build cells based on regions' different demographic characteristics to increase the variability of the exposure. Similar multigroup (cells) setups can be found in the literature in Bertrand, Duflo, and Mullainathan (2004) and Hansen (2007).

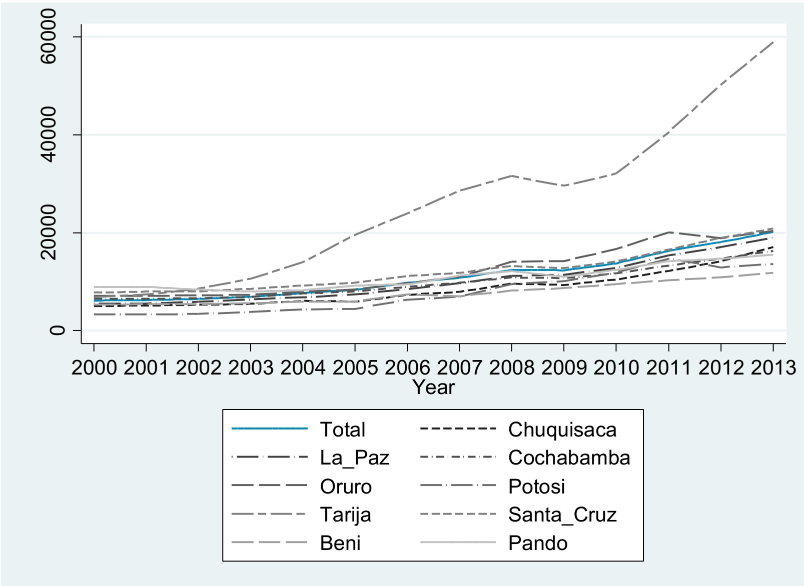
III. Minimum wages in Bolivia

As many countries in the region, Bolivia has experienced significant economic growth that was mainly driven by a commodities boom during the last decade. Moreover, this period was accompanied by an active socio-economic policy agenda promoted by the country's president, Evo Morales, since he took office in 2006. Bolivia's minimum wage is legislated by the central government; they change it by passing a decree without any debate in parliament. The application of this change is flat across all departments, economic sectors and occupations. The first important policy shift occurred on May 1, 2006, the national Labor Day, when the government set an increase in the nominal minimum wage of 13.6%; since then, minimum wage has increased every May at different rates, ranging from 5% to more than 20%. By 2011 and 2012, the growth of the minimum wage reached 20% and 22.6%, respectively (see Figure 1). There are three important characteristics of these increases: 1) the rate of increase of the minimum wage is unknown until the day of the announcement, which is contrary to what happens in developed countries where the legislation announces the rate of increase over several years in advance; 2) the increase announced at the beginning of May each year is applicable and mandatory from January of the same year; in other words, the law requires retroactive payments; and 3) the increase is flat across autonomous regions, even when the economic growth of the last ten years has been unequal across them (see Figure 2).

Figure 1: Generalized wage increase and lagged inflation (2003-2014).

Along with the increases in the national minimum wage, the government has also mandated a generalized wage increase with the purpose of keeping real wages constant. This is illustrated in Figure 1 by the high correlation (0.74) between the mandated increase at a given year (WI), and the previous year's inflation rate (LAG PRI). This policy is set to cover public and private workers earning above the minimum wage and, as can be seen in Figure 1, has ranged between 5% and 12% since 2006. As we will elaborate upon in the next section, we need to control for this generalized wage increase in order to provide proper identification of the MW effects.

Figure 2: GDP growth by region (2000-2013)



During the last four years the relative increase in nominal minimum wages have been well above inflation and GDP growth rates, suggesting that minimum wage fixation sought to increase real wages irrespective of labor productivity factors. Economic growth in Bolivia was determined by an expansive fiscal policy backed by favorable prices of minerals and hydrocarbons that specific autonomous departments in Bolivia produce, which implied heterogenous economic growth rates across departments. In this context, an increase in the national nominal minimum wage is less severe in real terms in a department where wages were higher prior to the MW rise (such as La Paz), while it could have higher real impacts in departments with lower wages such as Oruro. Because these nominal minimum wage increases were not directly related to regions' productivity growth, we consider this policy as an unexpected shock, not in nominal but in real terms. Moreover, we argue that since the policy was never discussed with the stakeholders, its application was uncertain and unexpected in terms of the magnitude of the MW increase.

Finally, it should be mentioned that informal employment remained a pervasive characteristic of the country, a feature that may affect the mechanisms by which minimum wage impacts labor market outcomes. Between 2005 and 2012, the average informal employment share was 67%. Furthermore, Landa (2008) found that between 1995 and 2005, the percentage of people in Bolivia who transitioned from the formal to the informal employment doubled those who transitioned in the other direction. This same study also showed that female, indigenous and low educated people had higher probabilities of being informal workers in Bolivia.

IV. Data and descriptive statistics

The empirical analysis builds on a household living conditions survey, the most reliable microdata in Bolivia. This survey has information on employment, occupation, wages, hours worked, and household and individual characteristics among other living condition characteristics. We define the Working Age Population (WAP) as the population of individuals aged 15 to 65 years old. In 2005, WAP represented 57.7% and in 2012, 61.4% of the entire population.

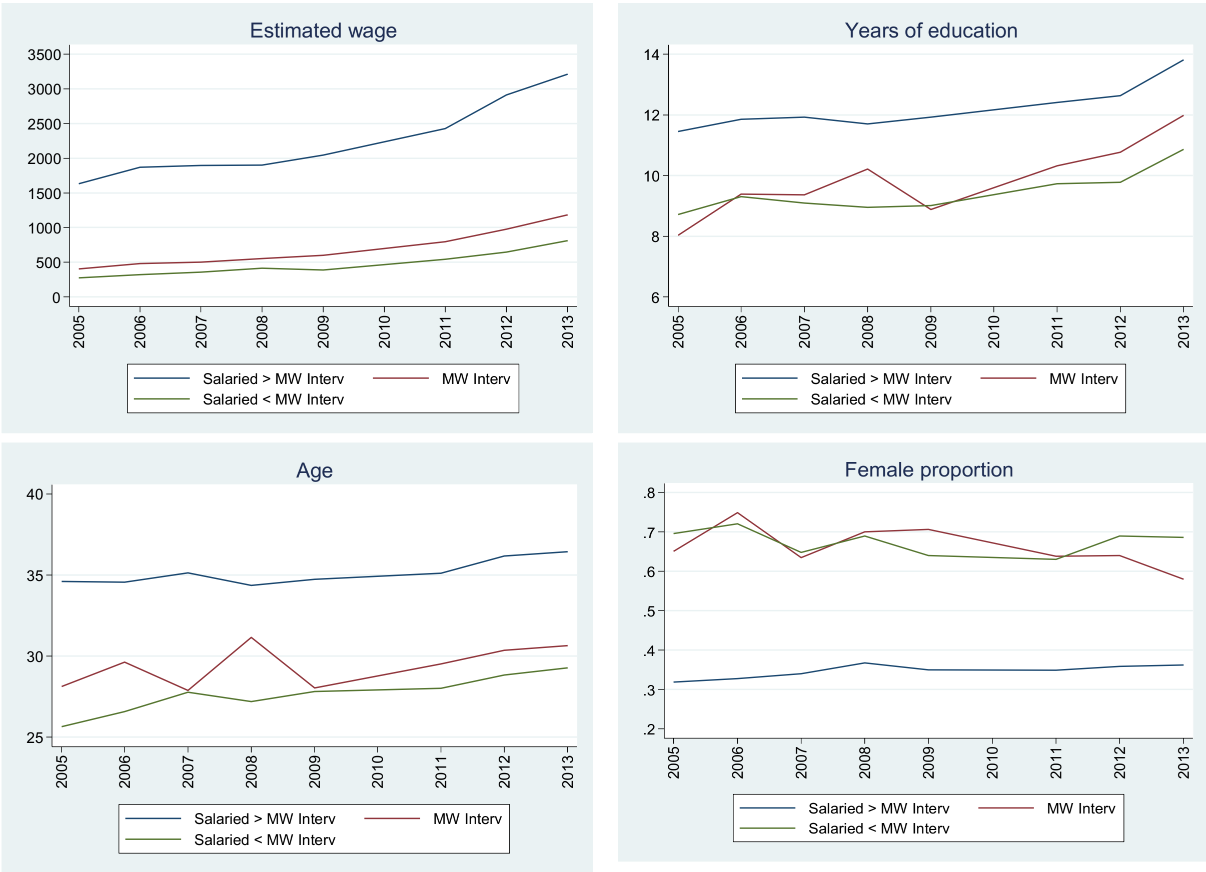
Labor force participation rates (LFPR) were 74.2% and 72.7% in 2005 and 2012, respectively. Although WAP was balanced among men and women, LFPR revealed some disparities; 84% of men participated in the labor force compared to only 67% of women. The average unemployment rate for men is 5% and 7.4% for women. Women have less participation in the labor market and they also seem to have fewer opportunities when looking for a job.

We consider an individual based informality definition. Under this approach, formality can be defined by several measurement criteria based on job characteristics, such as having a signed contract, belonging to a union, being entitled to benefits (that is, health insurance or pensions), working in the public sector, or paying taxes (Elif Öznur & Tansel, 2014). This has been known as the legalistic, contract-based or social protection definition of informality, and is the definition that will be used throughout this paper. More specifically, we define informal workers as those who do not have social benefits, that is, all salaried workers that do not contribute to pension funds.

There is a large self-employed group of workers, which is at least as large as the group of salaried workers. We will treat them as an independent category throughout the analysis.

Since they are not salaried workers, we follow Lemos (2009) and assume that they are not covered by the minimum wage legislation.

Figure 3 Trends in sociodemographic characteristics among salaried workers, by wage group (above, below and on the minimum wage (MW)



Since increases in minimum wage would directly affect those earning the current minimum wage, or those within a close range, we describe the socio-demographic characteristics of this group by comparing them to other salaried workers. These comparisons will allow us to characterize the direct beneficiaries of a minimum wage increase. Thus, we define a MW Interval (MW Interv) variable. The beneficiary group at a given point in time (year) is comprised by those earning between the current nominal MW and next year's MW. Figure 3 presents not only the MW interval, but also the evolution of those salaried workers earning above and below the MW.

Note that MW Interval workers seem to be younger, less skilled and mainly female compared to salaried workers that earn above the MW. Another important feature to highlight is that minimum wage earners have similar characteristics to those making less than the MW.

Finally, regional heterogeneity across the nine autonomous regions in Bolivia is illustrated in Table 1 for 2005, the year before the first significant increase in the nominal minimum wage. Significant differences can be observed in the percentage of salaried workers, as well as in the share of formal workers, public sector employment and average wages. These characteristics ensure that the changes in the flat minimum wage that have been taking place since 2006 lead to heterogenous impacts across the country's many regions.

Table 1 Labor market statistics by region, 2005

	Regions[a]									
	1	2	3	4	5	6	7	8	9	Total
Labor force participation rate (%)	69.2	66.84	65.95	65.65	62.56	71.4	66.45	68.6	83.64	66.84
Employment status (%)										
Salaried	26.55	29.88	30.78	18.22	27.95	33.98	37.59	33.36	33.74	32.05
Self-employed	24.91	27.53	23.9	32.92	26.49	25.31	20.67	23.26	35.66	24.63
Employed at the public sector (%)	35.46	24.83	13.28	23.95	27.75	32.62	11.74	31.8	48.76	19.55
Formal workers[b] (%)	34.63	33.68	29.05	51.12	29.33	40.48	32.65	30.62	41.73	33.12
Monthly wage among salaried (Bs.)	1,491	1,695	1,290	1,340	1,343	1,484	1,814	1,437	2,188	1,625

a. 1. Chuquisaca 2. La Paz 3. Cochabamba 4. Oruro 5. Potosí 6. Tarija 7. Santa Cruz 8. Beni 9. Pando
b. Employees who contribute to pension funds.

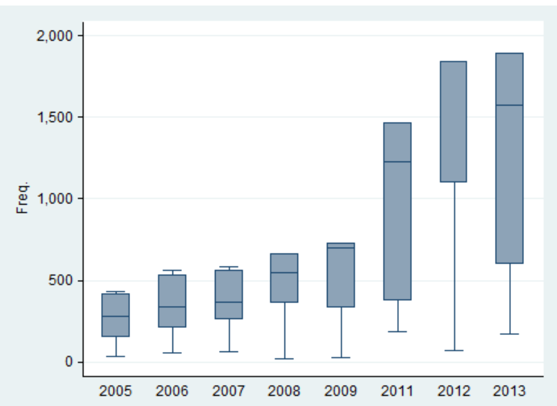
V. Identification strategy and results

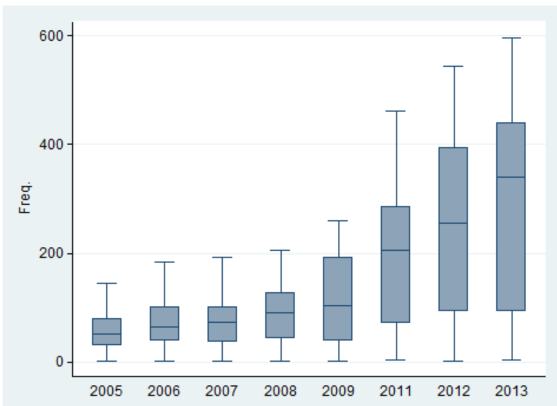
As argued before, minimum wage in Bolivia is set at the national level. This setting implies that even when all individuals are exposed to treatment, exposure might be heterogeneous across subsets of the observed population. This was previously suggested by Card (1992) and Dinkelman and Ranchhod (2012). In both papers, authors take advantage of geographical variation in the exposure to treatment and define a regional intensity of treatment. This regional variation in the intensity of treatment can be seen as a "natural experiment in which the treatment effect varies across states depending on the fraction of workers earning less than the minimum wage." (Card, 1992, p. 22). Likewise, Lemos (2009) defines artificial subsets of the population from regional and time variation to identify the effects of minimum wage in Brazil. We extend this approach and take different subsets of the population -denoted as cells[1] from now onwards- and measure the intensity of treatment across these cells. We refer to this intensity of treatment as the minimum wage bite at the cell level. The cell's definition depends on geographic and demographic characteristics, allowing for the construction of bites for a greater number of groups or cells.

We consider two different definitions of cells. A first and basic definition contains nine cells, each representing one of Bolivia's nine regions, which implies more individuals per group, but only nine groups in total. As mentioned by Dinkelman and Ranchhod (2012), and Wooldridge (2003), this approach represents a challenge for the estimation of standard errors since there is correlation within each region. To overcome this difficulty, we define cells (or pseudo-individuals) from a set of demographic characteristics: region, gender, and skill level (low, medium and high) which leads to constructing 54 cells. According to Wooldridge (2003), this approach is appropriate considering a rule of thumb of at least 50 cells in order to get accurate asymptotic normality and inference. As it will be shown later, these two approaches (9 and 54 cells) lead to similar parameters but with heterogenous inference. As argued by Wooldridge (2003), with a small number of cells (9), standard errors are expected to be downward biased.

Figure 4 presents boxplots with the distribution of the number of individuals within cells for each of the two approaches.

Figure 4: Cell sizes per year: left graph is for 9 cells, right graph is for 54 cells





The boxplot in Figure 4 shows the disperson in the number of individuals within cells while Tables 2 and 3 present descriptive statistics (total number of observations, mean,

[1] This can also be described as a pseudo-individual in the context of pseudo-panel data.

minimum, maximum and standard deviations) at the cell level for each definition. In our nine-cell definition, we observe a large number of observations even in smaller cells (19 for 2008). The 54-cell definition (Table 3) is characterized by smaller cells, with some of them presenting only 1 observation.

Table 2: Descriptive statistics for 9 cells (constructed using regions)

Year	Obs.	Mean	Std. Dev.	Min	Max
2005	1,786	292.10	138.34	36	434
2006	2,359	373.83	174.60	60	562
2007	2,530	395.28	177.01	62	586
2008	2,051	444.85	217.16	19	660
2009	2,249	521.33	262.46	25	726
2011	5,152	930.26	487.47	185	1467
2012	4,959	1201.74	593.36	72	1838
2013	6,385	1283.01	605.06	174	1893

Table 3: Descriptive statistics for 54 cells (constructed using regions, gender and skill level)

Year	Obs.	Mean	Std. Dev.	Min	Max	<15 observations (%)
2005	1,786	60.52	42.79	1	144	5.21
2006	2,359	78.30	52.17	1	184	4.58
2007	2,530	83.87	53.87	2	193	3.32
2008	2,051	92.91	57.86	1	206	5.8
2009	2,249	114.45	81.75	2	260	6.05
2011	5,152	200.23	133.31	5	462	1.24
2012	4,959	262.23	168.76	2	543	1.35
2013	6,385	293.21	182.58	4	596	1.14

A caveat of our second approach (54 cells) is the small number of individuals within some cells which could be a source of bias in the estimation of the exposures to treatment in every cell. As can be seen in the last column of Table 3, the share of workers in small sample cells is not high. The total sample for each year in small sample cells (cells with less than 15 observations) is in the range of 1.14% in 2013 to 6.05% in 2009. Thus, we remove these cells from our sample and obtain similar results (in our econometric estimations) as with the 9 regions (cells) approach (see appendix).

5.1. Exposure to treatment

We construct two different bites to capture the intensity of minimum wage increases in every cell. The first bite is the fraction affected, as in Card (1992). This variable is defined in equation (1) as the proportion of people in year *t* and cell *c* with earnings between current and next year's minimum wage. We use a second fraction affected definition also known as fraction below presented in equation (2), which is the proportion of employed people, in year *t* and cell *c*, with earnings below next year's minimum wage. We believe the second definition gathers more information considering Bolivia's labor market with its imperfect compliance of minimum wage legislation and the possibility of having affected individuals with earnings below the previous minimum wage.

$$FAF_{ct} = \frac{\sum_i^{n_c} \mathbf{1}[MW_t < w_{ict} < MW_{t+1}]}{n_{ct}} \quad (1)$$

$$FA_{ct} = \frac{\sum_i^{n_c} \mathbf{1}[w_{ict} < MW_{t+1}]}{n_{ct}} \quad (2)$$

Table 4 shows FA bites for every cell and year. We can observe that the bite has variability between cells and the proportion affected varies every year in each cell.

Table 4: Treatment exposure for constructed cells (FA bite)

	2005-2006	2006-2007	2007-2008	2008-2009	2009-2011	2011-2012	2012-2013
Beni	5.2%	11.0%	12.5%	1.0%	13.9%	9.7%	17.5%
Chuquisaca	5.8%	15.8%	13.9%	6.0%	8.6%	9.5%	12.7%
Cochabamba	10.4%	7.1%	9.3%	6.6%	10.7%	10.6%	11.8%
La Paz	10.4%	10.6%	9.2%	11.4%	10.6%	14.1%	16.8%
Oruro	13.1%	11.8%	6.7%	7.8%	7.1%	10.3%	13.6%
Pando	13.3%	2.0%	0.0%	0.0%	8.3%	3.0%	4.2%
Potosí	13.3%	9.5%	11.5%	0.0%	8.7%	6.0%	13.8%
Santa Cruz	4.8%	7.0%	10.6%	3.5%	5.9%	7.5%	11.8%
Tarija	15.8%	13.1%	11.1%	2.2%	9.0%	10.5%	9.0%

5.2. The confounding effect

As mentioned in the introduction, a second pillar of our methodological contribution seeks to disentangle the MW effects from the generealized increase aimed at salaried workers earning above the MW. This general wage increase can be considered a confounder to the MW increase, which if omitted, may induce a bias to our minimum wage effect estimate. Thus, we defined a parallel exposure to treatment or bite variable (called WINC hereafter) as the share of salaried workers earning above the minimum wage and making contributions to social security (a compliance with law proxy) within each cell. Formally:

$$WINC_{ct} = \frac{\sum_i^{n_c} \mathbf{1}[salaried\ worker\ \&\ contributes\ to\ social\ security\ \&\ wage_t > MW_t]}{n_{ct}} \quad (3)$$

5.3. Final specification

The alternative specifications (regressions) will include one of the two bites (FA_{ct};FAF_{ct}) to identify the minimum wage effect and the wage increase ($WINC_{ct}$) variable to identify the generalized increase intervention. Note that both bites can be interpreted as workers' estimated probabilities of receiving either a MW or a generalized increase, and therefore, might be correlated. Thus, $WINC_{ct}$ might not be an orthogonal regressor that could be omitted without leading to a potential omitted variables bias of a MW effect.

Since the MW effects can be heterogenous across time, we specify many difference in differences estimating equations for the many available pairs of years (before-after). For instance, pair 1 consists of years 2005-2006, pair 2 years 2006-2007, and so on. This specification avoids imposing the adjusting mechanisms and MW effects to be homogenous across time.

Our model has two variations regarding a standard difference-in-differences model: 1) we have a continuous instead of a dichotomous treatment, and 2) we have two exposures to treatment instead of one. These slight variations are not an issue for the econometric estimation. Thus, we estimate the following equations for every ordered pair of years in our data:

$$y_{ict}{}^{\varphi} = \beta_0 + \beta_1 post_t + \beta_2 \varphi_{ct} + \beta_3 male * post_t * \varphi_{ct} + \beta_4 female + \beta_5 female * post_t + \beta_6 female * \varphi_{ct} + \beta_7 female * \varphi_{ct} * post_t + \beta_8 WINC_{ct} + \beta_9 post * WINC_{ct} + \varepsilon_{ict} \quad (4)$$

$$\varphi = \begin{cases} FAF \\ FA \end{cases} \quad (5)$$

Where y_{ict} is a dependent variable pertaining to individual i in cell c at time t, *post* is a dummy variable for year *t (after dummy);* FA, FAF and $WINC$ were defined previously. The parameters of interest are β_3 and β_7 which capture the causal effect of the MW and generalized increase, respectively. Due to the data clustering in cells we use robust clustered standard errors at the cell level.

Our aim is to identify how the minimum wage increases affected wages, employment status, hours worked, formality and self-employment. We have two potential sources of bias: unobserved characteristics specific to each cell (u_c) can be correlated to the treatment, that is, since cells or pseudo-individuals are defined by worker age and gender, young women with primary education are expected to belong to a cell having a high bite (probability of being treated). Conversely, highly educated men belong to a cell with a lower bite. This can lead to a downward bias in the estimation of MW effects since the former group is expected to have a lower wage than the latter. On the other hand, we could also face a sample selection problem in the estimation of wages since we only observe wages for the employed sample.

The endogeneity concern is formally represented by the error components structure in equation (6) where the cell specific unobservable u_c could correlate with the cell's treatment intensity. Our estimation procedure implements the least square dummy variables estimator to control for u_c. This implies introducing cell specific dummy regressors among the explanatory variables to emulate a within transformation at the cell level.

$$\varepsilon_{ict} = u_c + u_t + u_{ict} \quad (6)$$

To address the sample selection problem, we implement Heckman sample selection model where the missing outcome pattern is modelled as:

$$y_{ict} = \begin{cases} y_{it} \; if \; y_{it} > \bar{y}_{it} \\ 0 \; otherwise \end{cases} \quad (7)$$

Where $\bar{y}_{it}$ in equation 7 is the unobserved individual reservation wage, y_{it} is worker's offered wage. We use the number of people within the household and marital status as the exclusion restrictions, since it is expected that those variables are related to individuals' working need, but not with their salary. For a reference on a similar approach see Idson and Feaster (1990) who used marital status when controlling for selection bias in wages, while

Ermisch and Wright (1993) estimated wage equations with marital status and number of children as exclusion restrictions.

Finally, for the estimation of the MW effects on wages, we employ the logarithm of the monthly real (not nominal) wages. Real wages are obtained by deflating the nominal wages by the national Price Consumer Index (PCI) published by the national bureau of statistics (INE). We use the national index given the unavailability of a regional PCI until 2008. To keep the consistency across years, we employ the national PCI to deflate wages in the whole sample (2005-2013).

The pair of years 2005-2006 may be considered a natural experiment, since from 2003 to 2005, nominal minimum wage remained invariant while in 2006 it had a sudden 13.6% increase, which was the result of an important policy shift, led by the incoming president. Among the many pairs of years, 2006 MW increase was a rather unexpected and sharp treatment that fits the standard dif-in-dif exogeneity assumptions. Nevertheless, from 2007 onwards, one can argue that employers' expectations about the future minimum wage increase played a role especially for the estimation of unemployment effects. Employers may anticipate a MW rise and start laying-off workers before the new minimum wage is set. This issue would downward bias the parameters of interest. However, we also argue that these concerns may be dealt through survey timing.

Results for 2005-2006 on real wages for 54 cells are presented in Table 5 (results for 9 cells are presented in the appendix). Outcomes for the two bites (FAF, FA) are shown and for each of them there are three different specifications; columns (1) and (3) present the estimation without controls, columns (2) and (4) add controls and finally, we present the Heckman selection correction model estimated parameters. The coefficient β_3 (post*bite*male) is the impact of MW increase over real wages for men, while β_7 (post*bite*female) is the impact on real wages for women. Additionally, we present the p-value for the Wald test over men and women parameters to ascertain if the effects are different for each group (the null hypothesis states that the parameters are equal).

Table 5 Effects on real wages (2005 - 2006)

Dependent Variable				log(real_wages) (2005-2006)		
			FAF			FA
	(1)	(2)	Heckman	(3)	(4)	Heckman
post*bite*male	1.0321	1.3599	1.2053	1.4710***	1.3657***	1.3011***
	(1.3304)	(0.8910)	(1.0089)	(0.5397)	(0.3891)	(0.4187)
post*bite*female	0.8484	0.4746	0.5126	0.7428*	0.3610	0.3251
	(0.5764)	(0.5101)	(0.5636)	(0.3962)	(0.3483)	(0.3850)
post*winc	-0.2243	-0.1317	-0.1137	0.0532	0.0349	0.0344
	(0.3178)	(0.2273)	(0.2453)	(0.3256)	(0.2301)	(0.2503)
controls	NO	YES	YES	NO	YES	YES
Obs.	3,087	3,087	5,191	3,087	3,087	5,191
Rho			-0.385			-0.359
			Difference between women and men			
p-value	0.902	0.411	0.561	0.305	0.0791	0.105
Cells	54	54	54	54	54	54

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Minimum wage increases had a positive and significant effect on men´s real wages when using the FA bite. The sign is the same for all the bites and the result is robust to the selection bias, given the parameters obtained with Heckman selection model (a negative and significant ρ was found). The effects on women are only significant at the 10% level but the parameter is reduced in half and its significance is lost when controls were added. These results suggest that there has been some bias against women, considering their wages did not increase as much as men's.

While the FAF lack of significance suggests that MW has no impact on workers affected by the last MW rise, the FA significance supports the hypothesis of a delayed compliance; that is, those left behind by previous MW rises are more likely to be leveled by a current MW rise.

When we estimate the effects on binary outcomes such as unemployment, we run a linear probability model (LPM) instead of a logit or probit model. We use this approach since the LPM gives consistent estimates of the parameters without imposing further assumptions. Despite the linear probability model (LPM) limitations, Anderson (1987) and Deke (2014) argue that it provides consistent estimates of binary regressors that neither a probit nor a logit can provide. Further discussions and references are provided in Caudill (1988) and Horrace and Oaxaca (2006).

According to our FAF bite, we found that minimum wage increases are associated with a higher and significant probability of being unemployed for men and have no effects on women's unemployment. However, the result for men is not robust to the addition of control variables. Therefore, we conclude that there is not enough evidence to support an effect of MW increases on employment.

Table 6 Effects on unemployment (2005 - 2006)

Dependent Variable	Unemployment (2005-2006)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	0.9274**	0.5874	0.2615	0.1946
	(0.4444)	(0.3964)	(0.2557)	(0.2560)
post*bite*female	0.2425	0.2373	-0.1640	-0.1409
	(0.2813)	(0.2641)	(0.1409)	(0.1421)
post*winc	0.2081**	0.2023**	0.0993	0.1160
	(0.0956)	(0.0912)	(0.0978)	(0.0991)
controls	NO	YES	NO	YES
Obs.	5,191	5,191	5,191	5,191
Difference between women and men				
p-value	0.185	0.450	0.140	0.237
Cells	54	54	54	54

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

As noted before, the effects of minimum wage increases could also be on the intensity of employment, measured as hours worked. We found no evidence of a reduction in the number of hours worked for both genders. This result can be explained by Bolivia's labor market characteristics, since it is not common that salaries are fixed by hours worked.

Table 7 Effects on hours worked (2005 - 2006)

Dependent Variable	Hours (2005-2006)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	39.9802	50.6357	20.6644	21.8877
	(35.3358)	(37.2512)	(15.5434)	(15.7908)
post*bite*female	-9.4146	-4.8224	8.9265	8.6399
	(17.4321)	(17.0402)	(10.6940)	(10.3107)
post*winc	2.7047	3.7299	7.5979	7.6111
	(6.5067)	(5.6535)	(7.8178)	(6.9267)
controls	NO	YES	NO	YES
Obs.	4,173	4,173	4,173	4,173
		Difference between women and men		
p-value	0.192	0.160	0.450	0.398
Cells	54	54	54	54

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Since there is little evidence of an important adjustment on employment as a consequence of the increase in minimum wage, it is expected that there are other adjustment mechanisms for firms to respond to the policy. As expected, we found a negative coefficient for the probability of having contributions to social security (or having a formal employment according to the presented definition of formality), for both men and women, with both parameters being equal according to the Wald test. This suggests that employers avoid laying-off employees, but instead they might take away employees' social benefits and decrease job offering quality. Since women's real wages have not increased with the policy, it seems surprising that there is a significant and negative effect on women´s probability of having contributions to social security. This result is an indication that the labor market might have some preference for men, and that women lose job quality to avoid being displaced by men.

Table 8 Effects on formality (2005 - 2006)

Dependent Variable	Formal (2005-2006)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	-0.4838	-0.4751	-0.3629*	-0.3621*
	(0.4602)	(0.4443)	(0.2150)	(0.2002)
post*bite*female	-0.1381	-0.1539*	-0.1196**	-0.1287**
	(0.0939)	(0.0899)	(0.0556)	(0.0531)
post*winc	-0.0497	-0.0603	-0.1061	-0.1190
	(0.0780)	(0.0721)	(0.0854)	(0.0786)
controls	NO	YES	NO	YES
Obs.	11,811	11,811	11,811	11,811
Difference between women and men				
p-value	0.471	0.482	0.277	0.258
Cells	54	54	54	54

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

The last variable of interest is the probability of being self-employed. As cited by Lemos (2009), self-employment can also be considered as a characteristic of informality in the labor market. We found no evidence of an effect on this outcome, but the signs of the parameters are unexpected, considering our previous results in formality.

Table 9 Effects on self-employment (2005 - 2006)

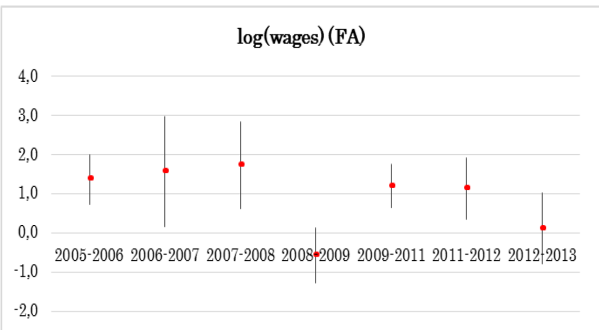
Dependent Variable	Self (2005-2006)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	-1.2747	-1.0455	-0.3688	-0.3393
	(1.0634)	(0.9116)	(0.3862)	(0.3424)
post*bite*female	-0.0426	-0.0498	-0.0023	0.0440
	(0.1358)	(0.1125)	(0.0960)	(0.0858)
post*winc	-0.0258	-0.0519	-0.0148	-0.0204
	(0.0705)	(0.0606)	(0.0928)	(0.0782)
controls	NO	YES	NO	YES
Obs.	11,811	11,811	11,811	11,811
Difference between women and men				
p-value	0.243	0.270	0.320	0.243
Cells	54	54	54	54

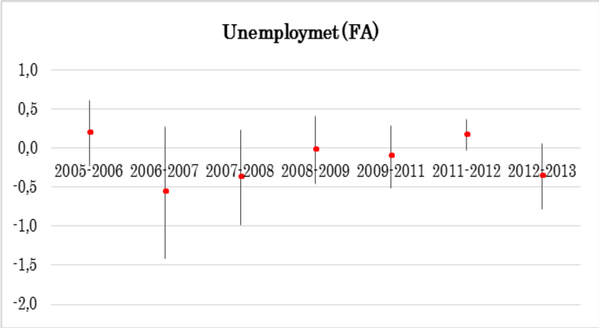
Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

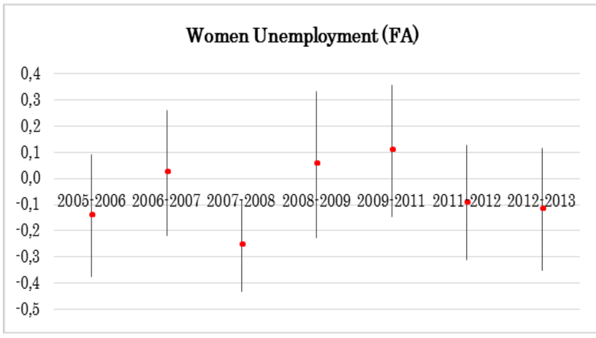
Given that the increases of minimum wage took place every year since 2006, we model the effects of these changes using the same identification strategy for the remaining pairs of years in the sample. These results are not as clean as the initial estimation (2005-2006), since in 2006 we had an unexpected policy shift. However, since the magnitude of the minimum wage increase is a surprise every year, our identification strategy continues to be valid.

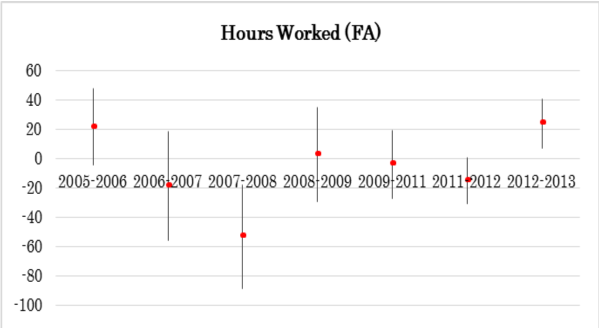
In order to facilitate coefficient comparison across years, we plotted the parameter of interest and its confidence intervals to show the effects in response to different minimum wage increases. The point is the parameter estimated with the FA bite and the lines represent a 90% confidence interval. In the appendix we present the tables with these results.

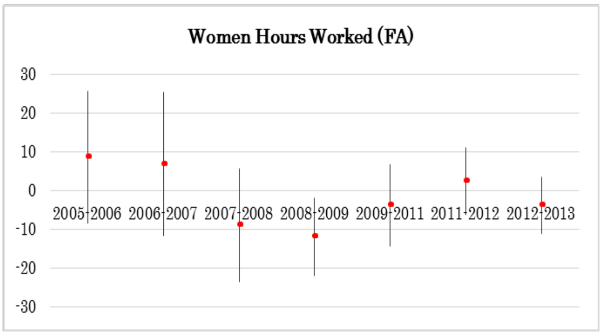
Figure 5: Point estimates for every pair of years and confidence intervals at 90% confidence level for FA bite

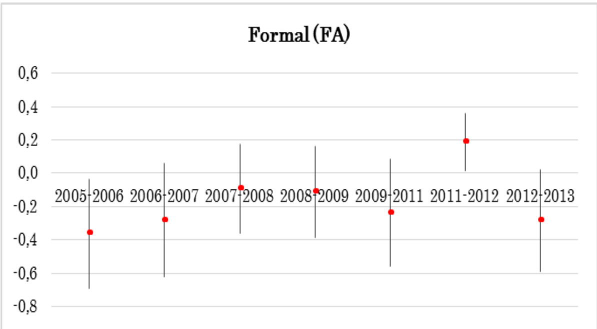


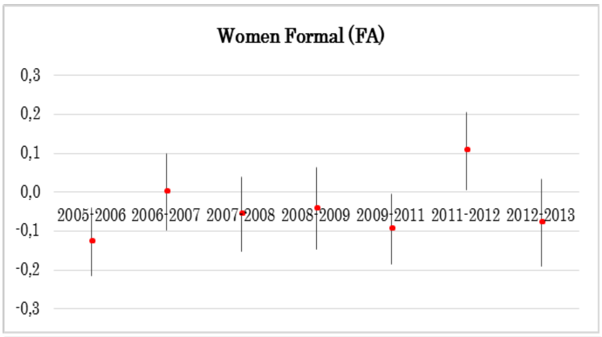


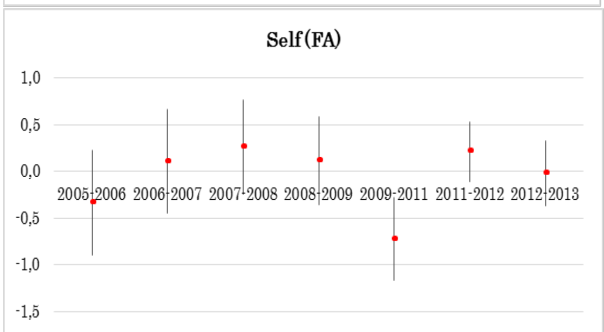












Our analysis focuses in the 2009-2011 pair because the minimum wage increase was unexpectedly high (20%). We found positive and significant effects on real wages for both men and women, with men benefiting more from the policy according to the Wald test. What is new in this specification is that there is some evidence of an increase in the probability of being unemployed for women in the FAF bite, and a reduction in the probability of women contributing to social security in both FAF and FA bites, but these results are only significant at the 10% level.

In the case of men, in the 2009-2011 pair of years, we found that there was a negative and significant effect on the probability of being self-employed. Our hypothesis for this counterintuitive parameter is that men might be attracted by greater wages and firms (with these wage levels) prefer to employ men rather than women, thus replacing women with men, or cutting women's social benefits.

In summary we find positive effects on men's real wages and some evidence of discrimination against women since women do not benefit from the policy. Moreover, women face some challenges since there is evidence that the policy might be incentivizing their displacement by men in the labor market. To summarize, minimum wage increases in Bolivia are effective to enhance purchasing power for men, but deteriorate the job quality for women.

VI. Conclusions

Since 2006, Bolivia implemented steep rises of the national government-legislated minimum wage across heterogenous regions in terms of labor productivity levels and economic growth. By using a difference in differences strategy, we analyzed the effects of this policy on different labor outcomes. We employed two different bite definitions; fraction affected (FAF) and fraction below (FA) and found that employers are more likely to raise wages of employees left unattended by previous MW rises first. The different effects found when using fraction affected (FAF) against (FA) fraction below, suggest that employers choose to partially comply with the MW regulation, that is, by increasing the wages of those earning below the previous minimum wage, leaving those affected by the new MW, unattended. Our findings also suggest that minimum wage policy had heterogeneous effects on men and women, pointing to a gender gap in MW compliance in favor of men.

For 2005-2006, when the policy shift occurred for the first time, our results reveal an increase in men's real wages (at the FA bite). At the same time, there is no strong evidence of unemployment effects, which suggest that employers may have been paying wages below workers value of marginal productivity (a signal that firms have some market power). Moreover, we find no evidence of an effect on the intensive margin (hours worked).

However, the significant informalization effect on men suggests that firms may chose to reduce workers' benefits in order to comply with the MW increase. These results are consistent across years, except for the informalization effect, which suggests that men benefit from the MW policy.

With respect to women, we found evidence of discrimination since their real wages did not increase as much as men's. Moreover, we found that the policy had a negative effect on formality (in 2005-2006 and 2009-2011). During the 2009-2011 period, women suffered unemployment and informalization effects (at the 10% significance level) while men's probability of being self-employed decreased. This result suggest that the higher MW may have motivated workers to stay salaried instead of going to self-employment; at the same time evidence suggests that firms have preferences towards men by displacing women in the labor market, or by reducing the quality of women's employment.

Overall, our findings indicate that the policy could be increasing men's wages, but endangering women's wellbeing and employment conditions. These adverse effects on women's outcomes are not compensated by higher wages, since the results show that women do not benefit from higher wages as much as men do. These results provide evidence of discriminatory practices in Bolivia's labour market that should be addressed by the regulatory institutions.

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Appendices

Appendix 1. Results obtained for the pair of years 2006-2007, 2008-2009, 2009-2011, and 2012-2013 using 54 cells

Real Wages

Dependent Variable	log(real_wages) (2006-2007)					
	FAF			FA		
	(1)	(2)	Heckman	(3)	(4)	Heckman
post*bite*male	2.8077	4.0704*	4.3523*	0.7840	1.5751*	1.5432*
	(2.7259)	(2.2521)	(2.3884)	(1.0832)	(0.8582)	(0.8429)
post*bite*female	-1.8285	-2.3169*	-2.2205*	0.3164	0.2938	0.3169
	(1.3827)	(1.3100)	(1.3290)	(0.4075)	(0.3857)	(0.3917)
Controls	NO	YES	YES	NO	YES	YES
Obs.	3,750	3,750	5,958	3,750	3,750	5,958
Rho			-0.228			-0.227
Difference between women and men						
p-value	0.172	0.0223	0.0192	0.708	0.218	0.226
Cells	54	54	54	54	54	54

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	log(real_wages) (2007-2008)					
	FAF			FA		
	(1)	(2)	Heckman	(3)	(4)	Heckman
post*bite*male	-0.7361	-1.2614	-1.2759	1.8841**	1.7334**	1.7981***
	(1.0495)	(1.2105)	(1.1324)	(0.7112)	(0.6735)	(0.6787)
post*bite*female	0.6091	0.6555	0.6246	0.3622	0.4020*	0.3744*
	(0.5046)	(0.4100)	(0.4051)	(0.2775)	(0.2160)	(0.2116)
Controls	NO	YES	YES	NO	YES	YES
Obs.	3,503	3,503	5,415	3,503	3,503	5,415
Rho			-0.143			-0.162
Difference between women and men						
p-value	0.261	0.131	0.104	0.0513	0.0587	0.0401
Cells	54	54	54	54	54	54

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	log(real_wages) (2008-2009)					
	FAF			FA		
	(1)	(2)	Heckman	(3)	(4)	Heckman
post*bite*male	-3.8423*	-3.8314*	-3.9628**	-0.4410	-0.5767	-0.5994
	(1.9437)	(2.0811)	(2.0124)	(0.4303)	(0.4306)	(0.4256)
post*bite*female	-1.0168	-0.5463	-0.4057	0.2948	0.3688	0.3986
	(0.8260)	(0.7403)	(0.7685)	(0.3630)	(0.3234)	(0.3251)
Controls	NO	YES	YES	NO	YES	YES
Obs.	3,191	3,191	4,941	3,191	3,191	4,941
Rho			-0.106			-0.165
				Difference between women and men		
p-value	0.231	0.171	0.123	0.217	0.0904	0.0670
Cells	54	54	54	54	54	54

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	log(real_wages) (2009-2011)					
	FAF			FA		
	(1)	(2)	Heckman	(3)	(4)	Heckman
post*bite*male	0.4703	0.8192	0.9707	0.9982**	1.1974***	1.3207***
	(0.6507)	(0.6301)	(0.6657)	(0.3873)	(0.3421)	(0.3576)
post*bite*female	0.2586	0.3314	0.3582	0.4473**	0.5433***	0.6101***
	(0.4290)	(0.4704)	(0.4606)	(0.1736)	(0.1589)	(0.1474)
Controls	NO	YES	YES	NO	YES	YES
Obs.	5,539	5,539	8,442	5,539	5,539	8,442
Rho			-0.362			-0.375
	Difference between women and men					
p-value	0.787	0.547	0.466	0.193	0.0860	0.0611
Cells	54	54	54	54	54	54

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	log(real_wages) (2011-2012)					
	FAF			FA		
	(1)	(2)	Heckman	(3)	(4)	Heckman
post*bite*male	1.9540**	1.6322**	1.7178***	1.2186**	1.1384**	1.2270***
	(0.8384)	(0.7116)	(0.6524)	(0.5086)	(0.4734)	(0.4664)
post*bite*female	-0.0485	-0.0870	-0.0310	0.1544	0.1181	0.1213
	(0.3090)	(0.2709)	(0.2717)	(0.1934)	(0.1740)	(0.1838)
Controls	NO	YES	YES	NO	YES	YES
Obs.	7,620	7,620	11,488	7,620	7,620	11,488
Rho			-0.323			-0.368
	Difference between women and men					
p-value	0.0279	0.0250	0.0126	0.0233	0.0181	0.00730
Cells	54	54	54	54	54	54

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	log(real_wages) (2012-2013)					
	FAF			FA		
	(1)	(2)	Heckman	(3)	(4)	Heckman
post*bite*male	0.0073	-0.0115	-0.2334	0.4500	0.1177	-0.0375
	(0.9656)	(0.8960)	(0.8389)	(0.5632)	(0.5507)	(0.4963)
post*bite*female	0.4209	0.4894	0.5761	0.6515***	0.5254***	0.5482***
	(0.4830)	(0.4120)	(0.3993)	(0.1531)	(0.1344)	(0.1345)
Controls	NO	YES	YES	NO	YES	YES
Obs.	8,565	8,565	12,785	8,565	8,565	12,785
Rho			-0.381			-0.384
	Difference between women and men					
p-value	0.637	0.529	0.273	0.681	0.397	0.178
Cells	54	54	54	54	54	54

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Unemployment

Dependent Variable	Unemployment (2006-2007)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	-1.5281	-1.7511	-0.5840	-0.5661
	(2.0038)	(1.8973)	(0.5151)	(0.5109)
post*bite*female	-0.9132	-0.9647	-0.0057	0.0210
	(1.2218)	(1.2123)	(0.1523)	(0.1455)
controls	NO	YES	NO	YES
Obs.	5,958	5,958	5,958	5,958
Difference between women and men				
p-value	0.788	0.722	0.235	0.224
Cells	54	54	54	54

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	Unemployment (2007-2008)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	-0.1816	-0.4856	-0.2818	-0.3760
	(0.7185)	(0.6175)	(0.3754)	(0.3685)
post*bite*female	-0.4688*	-0.5038**	-0.2198*	-0.2561**
	(0.2438)	(0.2161)	(0.1160)	(0.1066)
controls	NO	YES	NO	YES
Obs.	5,415	5,415	5,415	5,415
Difference between women and men				
p-value	0.690	0.977	0.860	0.739
Cells	54	54	54	54

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	Unemployment (2008-2009)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	0.3515	0.2197	-0.0269	-0.0256
	(1.0273)	(0.9551)	(0.2631)	(0.2626)
post*bite*female	0.9295**	0.9404**	0.0444	0.0534
	(0.4020)	(0.4074)	(0.1669)	(0.1689)
controls	NO	YES	NO	YES
Obs.	4,941	4,941	4,941	4,941
Difference between women and men				
p-value	0.566	0.440	0.781	0.750
Cells	54	54	54	54

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	Unemployment (2009-2011)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	0.0565	0.1045	-0.0733	-0.1073
	(0.3342)	(0.3373)	(0.2403)	(0.2422)
post*bite*female	0.5077*	0.4887*	0.1166	0.1062
	(0.2599)	(0.2573)	(0.1409)	(0.1524)
controls	NO	YES	NO	YES
Obs.	8,442	8,442	8,442	8,442
Difference between women and men				
p-value	0.269	0.363	0.464	0.396
Cells	54	54	54	54

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	Unemployment (2011-2012)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	0.1790	0.1589	0.1776	0.1694
	(0.2440)	(0.2245)	(0.1293)	(0.1192)
post*bite*female	-0.5190*	-0.4825*	-0.1133	-0.0931
	(0.2622)	(0.2569)	(0.1311)	(0.1331)
controls	NO	YES	NO	YES
Obs.	11,488	11,488	11,488	11,488
Difference between women and men				
p-value	0.0386	0.0445	0.0529	0.0685
Cells	54	54	54	54

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	Unemployment (2012-2013)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	-0.4934	-0.3262	-0.5434**	-0.3594
	(0.4019)	(0.3460)	(0.2650)	(0.2528)
post*bite*female	-0.1027	-0.0943	-0.1548	-0.1184
	(0.3244)	(0.3059)	(0.1397)	(0.1424)
controls	NO	YES	NO	YES
Obs.	12,785	12,785	12,785	12,785
Difference between women and men				
p-value	0.393	0.573	0.100	0.279
Cells	54	54	54	54

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Hours worked

Dependent Variable	Hours (2006-2007)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	-97.5053	-102.6847**	-5.0185	-18.4469
	(58.4200)	(46.4118)	(21.8906)	(22.5858)
post*bite*female	-6.6038	-2.5711	8.8913	6.8732
	(37.9200)	(35.9353)	(11.3198)	(11.3449)
controls	NO	YES	NO	YES
Obs.	4,927	4,927	4,927	4,927
Difference between women and men				
p-value	0.190	0.0812	0.533	0.277
Cells	54	54	54	54

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	Hours (2007-2008)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	-80.3144**	-68.7007**	-54.9476**	-52.8021**
	(34.0893)	(33.6951)	(21.9900)	(21.5028)
post*bite*female	-23.7841*	-22.9742*	-9.9569	-8.8939
	(12.0190)	(12.0222)	(9.1513)	(8.8591)
controls	NO	YES	NO	YES
Obs.	4,609	4,609	4,609	4,609
Difference between women and men				
p-value	0.102	0.179	0.0186	0.0233
Cells	54	54	54	54

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	Hours (2008-2009)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	42.2195	42.7114	6.1032	3.1807
	(89.2022)	(88.3861)	(18.2563)	(19.6365)
post*bite*female	-21.4765	-18.7433	-10.4918	-12.0555*
	(22.6804)	(19.3946)	(6.6941)	(6.0947)
controls	NO	YES	NO	YES
Obs.	4,321	4,321	4,321	4,321
Difference between women and men				
p-value	0.482	0.491	0.381	0.451
Cells	54	54	54	54

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	Hours (2009-2011)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	2.1308	1.1599	-5.3532	-3.7322
	(20.1750)	(21.3303)	(12.7288)	(14.0429)
post*bite*female	12.5664	9.0499	-2.0754	-3.7665
	(9.3441)	(10.2009)	(5.8075)	(6.3923)
controls	NO	YES	NO	YES
Obs.	7,430	7,430	7,430	7,430
Difference between women and men				
p-value	0.622	0.725	0.797	0.998
Cells	54	54	54	54

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	Hours (2011-2012)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	-32.9687*	-32.2241*	-14.2630	-14.7958
	(18.1256)	(17.2554)	(9.9858)	(9.4106)
post*bite*female	-4.1021	-4.6058	3.2734	2.4310
	(8.7066)	(8.9049)	(5.5719)	(5.2938)
controls	NO	YES	NO	YES
Obs.	10,159	10,159	10,159	10,159
Difference between women and men				
p-value	0.153	0.152	0.108	0.0861
Cells	54	54	54	54

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	Hours (2012-2013)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	50.5132***	38.5342**	34.6012***	24.1844**
	(16.3925)	(15.2409)	(10.1368)	(10.1224)
post*bite*female	-12.1810	-13.5469*	-2.4669	-3.7891
	(7.7274)	(7.8764)	(4.4741)	(4.5075)
controls	NO	YES	NO	YES
Obs.	11,392	11,392	11,392	11,392
Difference between women and men				
p-value	0.000200	0.000714	0.000123	0.00245
Cells	54	54	54	54

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Formal

Dependent Variable	Formal (2006-2007)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	-0.2071	-0.0659	-0.3263	-0.2805
	(0.7940)	(0.8099)	(0.2092)	(0.2060)
post*bite*female	0.0303	0.0420	-0.0143	0.0001
	(0.2250)	(0.2110)	(0.0592)	(0.0597)
controls	NO	YES	NO	YES
Obs.	13,172	13,172	13,172	13,172
Difference between women and men				
p-value	0.774	0.897	0.157	0.198
Cells	54	54	54	54

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	Formal (2007-2008)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	0.0167	-0.0039	-0.1304	-0.0932
	(0.3156)	(0.3402)	(0.1757)	(0.1631)
post*bite*female	-0.1865**	-0.1413*	-0.0708	-0.0561
	(0.0820)	(0.0830)	(0.0544)	(0.0577)
controls	NO	YES	NO	YES
Obs.	12,119	12,119	12,119	12,119
Difference between women and men				
p-value	0.537	0.694	0.746	0.830
Cells	54	54	54	54

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	Formal (2008-2009)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	-1.4768	-0.9985	-0.1226	-0.1102
	(0.9219)	(0.7527)	(0.1969)	(0.1670)
post*bite*female	0.0476	-0.0525	-0.0587	-0.0423
	(0.1271)	(0.1295)	(0.0696)	(0.0636)
controls	NO	YES	NO	YES
Obs.	11,162	11,162	11,162	11,162
Difference between women and men				
p-value	0.115	0.233	0.761	0.711
Cells	54	54	54	54

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	Formal (2009-2011)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	-0.3182	-0.2461	-0.2803	-0.2379
	(0.2458)	(0.1982)	(0.2223)	(0.1956)
post*bite*female	-0.1894*	-0.1669*	-0.1175**	-0.0947*
	(0.0970)	(0.0892)	(0.0578)	(0.0549)
controls	NO	YES	NO	YES
Obs.	19,671	19,671	19,671	19,671
	Difference between women and men			
p-value	0.615	0.703	0.466	0.468
Cells	54	54	54	54

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	Formal (2011-2012)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	0.4473**	0.5529***	0.1166	0.1877*
	(0.1726)	(0.1896)	(0.0970)	(0.1036)
post*bite*female	0.1213*	0.1353**	0.0903	0.1057*
	(0.0620)	(0.0625)	(0.0595)	(0.0605)
controls	NO	YES	NO	YES
Obs.	27,646	27,646	27,646	27,646
	Difference between women and men			
p-value	0.0659	0.0306	0.781	0.411
Cells	54	54	54	54

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	Formal (2012-2013)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	-0.1648	-0.5383*	-0.0476	-0.2844
	(0.2974)	(0.3191)	(0.1667)	(0.1846)
post*bite*female	-0.0666	-0.1877	-0.0418	-0.0787
	(0.1406)	(0.1515)	(0.0601)	(0.0683)
controls	NO	YES	NO	YES
Obs.	30,858	30,858	30,858	30,858
	Difference between women and men			
p-value	0.716	0.223	0.968	0.202
Cells	54	54	54	54

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Self-employment

Dependent Variable	Self (2006-2007)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	0.2745	0.4430	0.1152	0.1078
	(0.9720)	(0.8445)	(0.3946)	(0.3409)
post*bite*female	-0.0849	-0.0050	-0.0422	-0.0198
	(0.3966)	(0.3435)	(0.0922)	(0.0907)
controls	NO	YES	NO	YES
Obs.	13,172	13,172	13,172	13,172
Difference between women and men				
p-value	0.722	0.616	0.682	0.706
Cells	54	54	54	54

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	Self (2007-2008)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	0.4694	0.2942	0.3064	0.2556
	(0.5021)	(0.5787)	(0.3293)	(0.3080)
post*bite*female	-0.0467	0.0397	-0.0557	-0.0025
	(0.1644)	(0.1521)	(0.1119)	(0.1025)
controls	NO	YES	NO	YES
Obs.	12,119	12,119	12,119	12,119
Difference between women and men				
p-value	0.309	0.659	0.241	0.369
Cells	54	54	54	54

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	Self (2008-2009)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	1.0910	1.6685	0.0687	0.1111
	(1.1271)	(1.0066)	(0.3113)	(0.2864)
post*bite*female	0.1553	-0.0416	-0.1015	-0.1090
	(0.1990)	(0.1873)	(0.0863)	(0.0941)
controls	NO	YES	NO	YES
Obs.	11,162	11,162	11,162	11,162
Difference between women and men				
p-value	0.412	0.0976	0.585	0.450
Cells	54	54	54	54

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	Self (2009-2011)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	-0.4323	-0.4752	-0.7063**	-0.7239***
	(0.4182)	(0.3782)	(0.3054)	(0.2670)
post*bite*female	-0.0459	-0.0075	-0.0011	0.0150
	(0.1305)	(0.1270)	(0.0814)	(0.0827)
controls	NO	YES	NO	YES
Obs.	19,671	19,671	19,671	19,671
Difference between women and men				
p-value	0.349	0.212	0.0248	0.00861
Cells	54	54	54	54

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	Self (2011-2012)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	0.0414	0.2463	0.0756	0.2099
	(0.3119)	(0.3479)	(0.1654)	(0.1918)
post*bite*female	-0.0729	-0.0455	-0.0485	-0.0117
	(0.1454)	(0.1552)	(0.0963)	(0.1056)
controls	NO	YES	NO	YES
Obs.	27,646	27,646	27,646	27,646
Difference between women and men				
p-value	0.729	0.424	0.478	0.259
Cells	54	54	54	54

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	Self (2012-2013)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	0.6394	0.0190	0.2977	-0.0227
	(0.3995)	(0.3466)	(0.1977)	(0.2123)
post*bite*female	0.0017	-0.2215	-0.0385	-0.0783
	(0.1636)	(0.1451)	(0.0942)	(0.0704)
controls	NO	YES	NO	YES
Obs.	30,858	30,858	30,858	30,858
Difference between women and men				
p-value	0.0866	0.465	0.0529	0.773
Cells	54	54	54	54

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

A.2. Results obtained for the pair of years 2005-2006 using 54 cells with more than 15 observations per cell

Dependent Variable	log(real_wages) (2005-2006)					
	FAF			FA		
	(1)	(2)	Heckman	(3)	(4)	Heckman
post*bite*male	0.7822	1.0285	1.2053	1.3531**	1.3864***	1.3011***
	(1.4412)	(0.9960)	(1.0089)	(0.5691)	(0.3943)	(0.4187)
post*bite*female	1.1925*	0.7565	0.5126	0.9348*	0.5465	0.3251
	(0.6999)	(0.5872)	(0.5636)	(0.5176)	(0.4268)	(0.3850)
Controls	NO	YES	YES	NO	YES	YES
Obs.	2,931	2,931	5,191	2,931	2,931	5,191
Rho			-0.385			-0.359
Difference between women and men						
p-value	0.799	0.820	0.561	0.596	0.179	0.105
Cells	54	54	54	54	54	54

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	Unemployment (2005-2006)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	1.1754**	0.7889*	0.3853	0.3001
	(0.4493)	(0.4454)	(0.2539)	(0.2583)
post*bite*female	0.4575	0.4652	-0.0143	0.0265
	(0.4148)	(0.4166)	(0.1544)	(0.1481)
controls	NO	YES	NO	YES
Obs.	4,992	4,992	4,992	4,992
Difference between women and men				
p-value	0.200	0.540	0.167	0.335
Cells	54	54	54	54

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	Hours (2005-2006)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	43.4479	45.0670	17.2684	15.9581
	(35.9337)	(34.0945)	(14.3106)	(13.8699)
post*bite*female	-8.5953	-6.0772	2.0641	1.4255
	(20.8529)	(20.5399)	(11.6869)	(11.9478)
controls	NO	YES	NO	YES
Obs.	3,974	3,974	3,974	3,974
Difference between women and men				
p-value	0.183	0.167	0.313	0.313
Cells	54	54	54	54

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	Formal (2005-2006)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	-0.6174	-0.5912	-0.3887*	-0.3785*
	(0.4674)	(0.4461)	(0.2203)	(0.2034)
post*bite*female	-0.1552*	-0.1699*	-0.1202**	-0.1264**
	(0.0912)	(0.0862)	(0.0562)	(0.0532)
controls	NO	YES	NO	YES
Obs.	11,612	11,612	11,612	11,612
Difference between women and men				
p-value	0.342	0.356	0.240	0.226
Cells	54	54	54	54

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	Self (2005-2006)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	-1.2481	-0.9559	-0.3237	-0.2887
	(1.1351)	(0.9858)	(0.4011)	(0.3592)
post*bite*female	-0.0094	-0.0236	0.0215	0.0676
	(0.1541)	(0.1286)	(0.1062)	(0.0958)
controls	NO	YES	NO	YES
Obs.	11,612	11,612	11,612	11,612
Difference between women and men				
p-value	0.271	0.340	0.368	0.303
Cells	54	54	54	54

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

A.3. Results obtained for the pair of years 2005-2006, 2006-2007, 2008-2009, 2009-2011, and 2012-2013 using 9 cells

Real Wages

Dependent Variable	log(real_wages) (2005-2006)					
	FAF			FA		
	(1)	(2)	Heckman	(3)	(4)	Heckman
post*bite*male	0.9647	2.3682	3.1759	2.1757**	1.8595**	2.1581***
	(2.8572)	(2.4536)	(2.4307)	(0.7093)	(0.6418)	(0.6577)
post*bite*female	2.9126	3.5659	4.4762	2.8067	2.2443**	2.5534**
	(2.6793)	(3.2753)	(3.4782)	(1.7897)	(0.9629)	(1.1970)
controls	NO	YES	YES	NO	YES	YES
Obs.	3,087	3,087	5,194	3,087	3,087	5,194
Rho			-0.402			-0.398
Difference between women and men						
p-value	0.494	0.571	0.571	0.783	0.791	0.808
Cells	9	9	9	9	9	9

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	log(real_wages) (2006-2007)					
	FAF			FA		
	(1)	(2)	Heckman	(3)	(4)	Heckman
post*bite*male	-3.1566	-3.5781	-3.7274	1.0976	2.6900**	2.6875***
	(6.5609)	(8.7454)	(8.4547)	(1.6494)	(0.8930)	(0.8952)
post*bite*female	-15.1817**	-10.8467	-9.8123*	0.9093	3.0559***	2.8865***
	(5.8023)	(5.9825)	(5.8211)	(1.1216)	(0.7781)	(0.8496)
controls	NO	YES	YES	NO	YES	YES
Obs.	3,750	3,750	5,958	3,750	3,750	5,958
Rho			-0.225			-0.224
Difference between women and men						
p-value	0.0223	0.346	0.385	0.889	0.802	0.896
Cells	9	9	9	9	9	9

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	log(real_wages) (2007-2008)					
	FAF			FA		
	(1)	(2)	Heckman	(3)	(4)	Heckman
post*bite*male	-6.9190	-4.7339	-4.8171	6.2699***	2.6871	2.7439*
	(4.0146)	(3.4428)	(3.3851)	(1.8608)	(1.6695)	(1.6410)
post*bite*female	3.9145	2.8029	3.3376	7.1286**	5.3780**	5.4414***
	(8.3907)	(5.4388)	(5.1842)	(2.6869)	(1.9260)	(1.8120)
controls	NO	YES	YES	NO	YES	YES
Obs.	3,503	3,503	5,415	3,503	3,503	5,415
Rho			-0.123			-0.133
Difference between women and men						
p-value	0.113	0.189	0.109	0.692	0.288	0.244
Cells	9	9	9	9	9	9

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	log(real_wages) (2008-2009)					
	FAF			FA		
	(1)	(2)	Heckman	(3)	(4)	Heckman
post*bite*male	-4.8992	-7.2685	-6.8413	-1.2097**	-1.8998***	-1.8754***
	(2.7519)	(4.7109)	(4.5054)	(0.3819)	(0.5294)	(0.5184)
post*bite*female	-7.9090	-2.4260	-1.9714	-0.0720	0.0853	-0.0160
	(4.7848)	(4.1879)	(4.1601)	(1.0451)	(0.7461)	(0.7265)
controls	NO	YES	YES	NO	YES	YES
Obs.	3,198	3,198	4,948	3,198	3,198	4,948
Rho			-0.153			-0.139
Difference between women and men						
p-value	0.632	0.487	0.446	0.374	0.0928	0.0731
Cells	9	9	9	9	9	9

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	log(real_wages) (2009-2011)					
	FAF			FA		
	(1)	(2)	Heckman	(3)	(4)	Heckman
post*bite*male	-1.3644	-1.5846	-2.1150	0.2396	0.1961	-0.1714
	(1.3737)	(1.6337)	(1.9418)	(0.7420)	(0.9786)	(0.9571)
post*bite*female	1.5703	2.1941	1.5439	0.4106	0.4740	0.3175
	(2.9593)	(1.4631)	(1.2425)	(1.2886)	(0.9468)	(0.8428)
controls	NO	YES	YES	NO	YES	YES
Obs.	5,551	5,551	8,462	5,551	5,551	8,462
Rho			-0.276			-0.307
Difference between women and men						
p-value	0.259	0.0256	0.00566	0.915	0.852	0.681
Cells	9	9	9	9	9	9

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	log(real_wages) (2011-2012)					
	FAF			FA		
	(1)	(2)	Heckman	(3)	(4)	Heckman
post*bite*male	0.3387	0.7809	0.7334	0.7154*	0.7073	0.7552
	(1.3690)	(1.3340)	(1.4462)	(0.3617)	(0.5668)	(0.5720)
post*bite*female	-0.6185	0.3102	0.9213	-0.6625	-0.1777	0.0336
	(2.1893)	(1.3126)	(1.5974)	(1.0400)	(0.6034)	(0.6500)
controls	NO	YES	YES	NO	YES	YES
Obs.	7,620	7,620	11,488	7,620	7,620	11,488
Rho			-0.303			-0.310
Difference between women and men						
p-value	0.779	0.861	0.950	0.307	0.459	0.544
Cells	9	9	9	9	9	9

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	log(real_wages) (2012-2013)					
	FAF			FA		
	(1)	(2)	Heckman	(3)	(4)	Heckman
post*bite*male	3.5397**	4.9007**	4.6278***	0.2051	0.7221	0.6541
	(1.1288)	(1.5005)	(1.4002)	(0.5969)	(0.6164)	(0.6431)
post*bite*female	1.9901	2.0199	1.5573	3.0335**	1.7555**	1.8014***
	(3.3844)	(2.2493)	(2.2723)	(0.9098)	(0.6081)	(0.5966)
controls	NO	YES	YES	NO	YES	YES
Obs.	8,565	8,565	12,785	8,565	8,565	12,785
Rho			-0.322			-0.343
Difference between women and men						
p-value	0.724	0.306	0.272	0.0789	0.334	0.276
Cells	9	9	9	9	9	9

Robust standard errors in parentheses   *** p<0.01, ** p<0.05, * p<0.1

Unemployment

Dependent Variable	Unemployment (2005-2006)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	2.2306**	1.4231*	0.8963**	0.7610**
	(0.7752)	(0.7164)	(0.3839)	(0.2397)
post*bite*female	2.2306**	1.4231*	0.4852	0.3991
	(0.7752)	(0.7164)	(0.3910)	(0.3723)
controls	NO	YES	NO	YES
Obs.	5,194	5,194	5,194	5,194
Difference between women and men				
p-value	0.344	0.390	0.553	0.507
Cells	9	9	9	9

Robust standard errors in parentheses   *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	Unemployment (2006-2007)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	-4.8139	-4.5401	-1.4517**	-1.3322**
	(4.9003)	(4.6804)	(0.6002)	(0.5061)
post*bite*female	-3.7340*	-3.1772	-0.9924**	-0.9201**
	(1.6699)	(1.7451)	(0.3691)	(0.3436)
controls	NO	YES	NO	YES
Obs.	5,958	5,958	5,958	5,958
Difference between women and men				
p-value	0.854	0.793	0.473	0.472
Cells	9	9	9	9

Robust standard errors in parentheses   *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	Unemployment (2007-2008)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	1.5956	1.1576	0.9694	1.0741
	(1.5484)	(1.5554)	(0.5661)	(0.6979)
post*bite*female	2.8766	3.0008	0.7476	0.7543
	(2.8091)	(2.4053)	(1.2713)	(1.1836)
controls	NO	YES	NO	YES
Obs.	5,415	5,415	5,415	5,415
	Difference between women and men			
p-value	0.658	0.465	0.900	0.857
Cells	9	9	9	9

Robust standard errors in parentheses   *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	Unemployment (2008-2009)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	-3.7459	-3.3688	0.1502	0.1596
	(2.2030)	(2.2115)	(0.3922)	(0.3828)
post*bite*female	0.9887	0.7940	-0.4245	-0.4838
	(2.8681)	(2.8242)	(0.6498)	(0.6508)
controls	NO	YES	NO	YES
Obs.	4,948	4,948	4,948	4,948
	Difference between women and men			
p-value	0.227	0.285	0.445	0.392
Cells	9	9	9	9

Robust standard errors in parentheses   *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	Unemployment (2009-2011)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	-0.1945	-0.3519	-0.5794	-0.7205
	(1.1967)	(1.1676)	(0.4070)	(0.3971)
post*bite*female	-1.6696	-1.8333	-1.0203**	-1.1343**
	(1.0470)	(1.0437)	(0.4252)	(0.4381)
controls	NO	YES	NO	YES
Obs.	8,462	8,462	8,462	8,462
	Difference between women and men			
p-value	0.397	0.343	0.521	0.525
Cells	9	9	9	9

Robust standard errors in parentheses   *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	Unemployment (2011-2012)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	-0.2435	-0.2464	0.2524	0.2264
	-0.6823	-0.6133	(0.1795)	(0.1790)
post*bite*female	0.7352	0.8366	0.5427*	0.5696*
	(0.5553)	(0.5647)	(0.2481)	(0.2682)
controls	NO	YES	NO	YES
Obs.	11,488	11,488	11,488	11,488
Difference between women and men				
p-value	0.0948	0.0743	0.0616	0.0694
Cells	9	9	9	9

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	Unemployment (2012-2013)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	-1.1322	-0.9686	-0.3553*	-0.3001
	(0.7923)	(0.8378)	(0.1735)	(0.1688)
post*bite*female	-2.1973	-2.1625	-0.6917	-0.6356
	(1.6499)	(1.6470)	(0.6959)	(0.6732)
controls	NO	YES	NO	YES
Obs.	12,785	12,785	12,785	12,785
Difference between women and men				
p-value	0.411	0.344	0.579	0.578
Cells	9	9	9	9

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Hours Worked

Dependent Variable	Hours (2005-2006)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	-43.3115	-68.3348	22.5944	17.0450
	(84.6681)	(82.1388)	(27.3607)	(27.4839)
post*bite*female	-201.4148**	-201.1103**	-41.1274	-38.9394
	(84.7937)	(85.5792)	(36.7787)	(31.8427)
controls	NO	YES	NO	YES
Obs.	4,175	4,175	4,175	4,175
Difference between women and men				
p-value	0.0496	0.0983	0.129	0.130
Cells	9	9	9	9

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	Hours (2006-2007)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	139.4013	165.7397	-30.8470	-40.5187
	(92.6125)	(177.4848)	(17.9771)	(24.2134)
post*bite*female	-372.2580**	-411.4305*	58.3128	67.4294
	(147.0040)	(218.2757)	(35.3561)	(44.8136)
controls	NO	YES	NO	YES
Obs.	4,927	4,927	4,927	4,927
Difference between women and men				
p-value	0.0352	0.0392	0.111	0.0644
Cells	9	9	9	9

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	Hours (2007-2008)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	203.7566	193.0874	-144.5408*	-97.6819
	(139.9728)	(121.6461)	(72.5725)	(68.5446)
post*bite*female	- 169.9645*	-254.8321**	-75.2800	-30.5941
	(84.7312)	(84.5319)	(67.1191)	(71.0868)
controls	NO	YES	NO	YES
Obs.	4,609	4,609	4,609	4,609
Difference between women and men				
p-value	0.0313	0.00893	0.495	0.482
Cells	9	9	9	9

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	Hours (2008-2009)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	-515.9313***	-488.8424***	-18.1439	-10.1466
	(55.3644)	(79.6932)	(23.8519)	(24.3353)
post*bite*female	-170.0607*	-109.8095	10.6316	8.2364
	(87.5657)	(79.6523)	(15.7268)	(17.2580)
controls	NO	YES	NO	YES
Obs.	4,328	4,328	4,328	4,328
Difference between women and men				
p-value	0.00195	0.000203	0.145	0.307
Cells	9	9	9	9

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	Hours (2009-2011)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	108.6470	92.3808	72.7563***	68.0244***
	(59.9696)	(52.4324)	(15.9467)	(13.0266)
post*bite*female	47.7986	53.7036	3.1444	-3.6716
	(45.8854)	(63.0111)	(21.8845)	(24.7869)
controls	NO	YES	NO	YES
Obs.	7,445	7,445	7,445	7,445
Difference between women and men				
p-value	0.540	0.716	0.0400	0.0511
Cells	9	9	9	9

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	Hours (2011-2012)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	-37.1218	-35.0774	-35.6522**	-32.2339**
	(42.9688)	(39.6729)	(12.5472)	(12.3918)
post*bite*female	6.0552	-10.5176	13.4501*	9.3728**
	(26.9082)	(27.8635)	(7.0207)	(3.6214)
controls	NO	YES	NO	YES
Obs.	10,159	10,159	10,159	10,159
Difference between women and men				
p-value	0.484	0.696	0.000679	0.00612
Cells	9	9	9	9

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	Hours (2012-2013)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	48.4449*	28.9733	10.2430	8.3510
	(22.2828)	(32.6376)	(19.4723)	(20.8824)
post*bite*female	-4.7244	12.1259	-47.4227***	-32.2882***
	(61.6214)	(56.1483)	(10.3776)	(7.1430)
controls	NO	YES	NO	YES
Obs.	11,392	11,392	11,392	11,392
Difference between women and men				
p-value	0.476	0.836	0.0250	0.0812
Cells	9	9	9	9

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Formal

Dependent Variable	Formal (2005-2006)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	-1.8876**	-2.2395**	-0.6372**	-0.7795**
	(0.6317)	(0.7628)	(0.2375)	(0.2712)
post*bite*female	-0.4806	-0.7076	-0.1204	-0.1910
	(0.3551)	(0.4040)	(0.1560)	(0.1344)
controls	NO	YES	NO	YES
Obs.	11,837	11,837	11,837	11,837
Difference between women and men				
p-value	0.0525	0.0195	0.0402	0.0141
Cells	9	9	9	9

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	Formal (2006-2007)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	-1.5412	-0.6102	-0.0764	-0.2397
	(2.0920)	(1.3035)	(0.4392)	(0.3034)
post*bite*female	-0.8725	-0.2763	0.0415	-0.0333
	(1.4342)	(0.6603)	(0.2220)	(0.1205)
controls	NO	YES	NO	YES
Obs.	13,172	13,172	13,172	13,172
Difference between women and men				
p-value	0.530	0.766	0.720	0.591
Cells	9	9	9	9

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	Formal (2007-2008)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	1.5924	2.2945**	1.8728**	0.9777
	(1.4585)	(0.8358)	(0.7927)	(0.7544)
post*bite*female	-0.8953	0.2709	0.1562	-0.2694
	(0.6444)	(0.4949)	(0.5056)	(0.5122)
controls	NO	YES	NO	YES
Obs.	12,119	12,119	12,119	12,119
Difference between women and men				
p-value	0.0302	0.0246	0.00396	0.0121
Cells	9	9	9	9

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	Formal (2008-2009)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	3.8443***	1.2575*	0.3075	0.0733
	(0.6815)	(0.5774)	(0.1987)	(0.1329)
post*bite*female	-0.5483	-1.9175	0.2019	0.2019
	(1.2286)	(1.3135)	(0.1355)	(0.1097)
controls	NO	YES	NO	YES
Obs.	11,194	11,194	11,194	11,194
Difference between women and men				
p-value	0.000684	0.0189	0.510	0.437
Cells	9	9	9	9

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	Formal (2009-2011)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	-2.0842**	-1.3527*	-0.7103*	-0.3608
	(0.6636)	(0.6929)	(0.3556)	(0.2920)
post*bite*female	0.3139	0.2291	0.1071	-0.0005
	(0.4002)	(0.5305)	(0.1819)	(0.1974)
controls	NO	YES	NO	YES
Obs.	19,721	19,721	19,721	19,721
Difference between women and men				
p-value	0.0459	0.205	0.125	0.451
Cells	9	9	9	9

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	Formal (2011-2012)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	0.1823	0.5061	0.2500	0.3468**
	(0.4156)	(0.3123)	(0.1714)	(0.1054)
post*bite*female	0.1308	0.6572**	0.0736	0.2479*
	(0.2436)	(0.2523)	(0.1176)	(0.1256)
controls	NO	YES	NO	YES
Obs.	27,646	27,646	27,646	27,646
Difference between women and men				
p-value	0.897	0.781	0.104	0.656
Cells	9	9	9	9

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	Formal (2012-2013)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	-1.4014*	-1.3243**	-0.6800**	-0.7750***
	(0.6662)	(0.4468)	(0.2155)	(0.1084)
post*bite*female	-0.0222	0.0137	0.2554	0.1178
	(0.9020)	(0.7373)	(0.1942)	(0.1720)
controls	NO	YES	NO	YES
Obs.	30,858	30,858	30,858	30,858
Difference between women and men				
p-value	0.177	0.148	0.0232	0.00514
Cells	9	9	9	9

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Self-employed

Dependent Variable	Self (2005-2006)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	-1.2370	-1.0674	-0.5741	-0.5108
	(1.7939)	(1.3058)	(0.5053)	(0.4448)
post*bite*female	0.4216	0.7211**	-0.0020	0.0919
	(0.4433)	(0.3089)	(0.2100)	(0.1714)
controls	NO	YES	NO	YES
Obs.	11,837	11,837	11,837	11,837
Difference between women and men				
p-value	0.332	0.186	0.289	0.212
Cells	9	9	9	9

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	Self (2006-2007)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	-2.9739	-3.1105*	-0.1728	-0.2898
	(1.9095)	(1.4579)	(0.3681)	(0.2997)
post*bite*female	-0.7432	-1.0833	0.4022	0.6562
	(3.1233)	(2.7174)	(0.5391)	(0.3995)
controls	NO	YES	NO	YES
Obs.	13,172	13,172	13,172	13,172
Difference between women and men				
p-value	0.472	0.533	0.499	0.185
Cells	9	9	9	9

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	Self (2007-2008)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	-1.5345	-2.8658**	-0.0244	-0.2204
	(1.3881)	(1.1130)	(0.9149)	(0.9612)
post*bite*female	0.1945	-0.9331	1.0327	1.0290*
	(0.8404)	(0.5733)	(0.7144)	(0.4549)
controls	NO	YES	NO	YES
Obs.	12,119	12,119	12,119	12,119
Difference between women and men				
p-value	0.288	0.209	0.289	0.236
Cells	9	9	9	9

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	Self (2008-2009)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	0.5876	1.0983	-0.1023	0.0653
	(2.0807)	(1.7279)	(0.4323)	(0.3618)
post*bite*female	-0.0405	0.4156	-0.0620	0.0208
	(1.3191)	(0.8963)	(0.1643)	(0.1209)
controls	NO	YES	NO	YES
Obs.	11,194	11,194	11,194	11,194
Difference between women and men				
p-value	0.681	0.589	0.904	0.873
Cells	9	9	9	9

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	Self (2009-2011)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	-2.0591	-1.6643	-2.0404***	-1.9057***
	(1.7031)	(1.7268)	(0.4929)	(0.4720)
post*bite*female	-0.4730	-0.4679	-1.0131***	-1.0262***
	(0.7746)	(0.8030)	(0.1646)	(0.1575)
controls	NO	YES	NO	YES
Obs.	19,721	19,721	19,721	19,721
Difference between women and men				
p-value	0.223	0.320	0.0260	0.0400
Cells	9	9	9	9

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	Self (2011-2012)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	-0.4599	-0.5850	-0.0667	-0.0604
	(0.5062)	(0.5389)	(0.2391)	(0.2549)
post*bite*female	0.6644	0.7683	0.4700*	0.6249**
	(0.5819)	(0.7220)	(0.2057)	(0.2488)
controls	NO	YES	NO	YES
Obs.	27,646	27,646	27,646	27,646
Difference between women and men				
p-value	0.0832	0.0167	0.0566	0.00198
Cells	9	9	9	9

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable	Self (2012-2013)			
	FAF		FA	
	(1)	(2)	(3)	(4)
post*bite*male	0.8445	0.3461	0.4230*	0.3413
	(0.4707)	(0.4547)	(0.2107)	(0.2235)
post*bite*female	-0.9913	-1.0866**	-0.7096***	-0.6668***
	(0.6129)	(0.4560)	(0.1158)	(0.1295)
controls	NO	YES	NO	YES
Obs.	30,858	30,858	30,858	30,858
Difference between women and men				
p-value	0.0245	0.0802	0.000161	0.00118
Cells	9	9	9	9

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1