Political Variables as Instruments: Are They Good Candidates?

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The international literature on minimum wage greatly lacks empirical evidence from developing countries. In Brazil, not only are increases in the minimum wage large and frequent - unlike the typically small increases focused upon in most of the existing literature - but also the minimum wage has been used as anti-inflation policy in addition to its social role. This paper estimates the effects of the minimum wage on employment using monthly household data (similar to the US CPS) from 1982 to 2000 aggregated at regional level. A number of conceptual and identification questions are discussed as tentative explanation of the non-negative estimates found in the literature, for example: (1) The superiority of "spike" over "fraction affected" and "Kaitz index" as a minimum wage variable; (2) Political variables as excluded exogenous instruments; (3) Decomposition of the minimum wage employment effect into hours worked and number of jobs effects. (4) Informal and public sectors sorting robustness checks. Robust results to various alternative specifications and instrumental variables indicate that an increase in the minimum wage has moderately small adverse effects on employment.

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There is currently not much consensus on the direction of the employment effects. The old debate between Stigler (1946) and Lester (1946), dormant since the early 80s in an apparent consensus of negative significant but modest effects on employment (Brown, Gilroy and Kohen, 1982) has been re-awakened. On the one hand, Neumark and Wascher (1992) and Deere et al. (1995), among others, find results consistent with the standard model prediction of a negative employment effect. On the other hand, Card and Krueger (1995) and Dickens et al. (1999), among others, challenge such a prediction, unable to find disemployment effects. Explanations to non-negative effects range from theory to empirical identification and data issues (Card and Krueger, 1995; Brown, 1999). In a recent survey, Brown (1999, p.2154) remarks: "the minimum-wage effect is small (and zero is often hard to reject)". While there is yet no consensus, small employment effects, clustered around zero, are becoming prevalent in the literature (Freeman, 1994 and 1996; Brown, 1999).

In studies for Brazil, in line with the international empirical literature, an increase in the minimum wage does not always have a significant effect on employment and it is not always negative, inspite of sizeable wage effects (Camargo, 1984; Velloso, 1988; Neri, 1997; Carneiro, 2000; Carneiro, 2002; Corseuil and Servo, 2002). Using national aggregate data, this literature estimates average wage and employment effects relying on the so-called *ad hoc* identification, which depends on restrictions on time modeling, predominant in the early time series literature. This paper estimates the effects of the minimum wage on employment using panel data techniques and monthly Brazilian household data from 1982 to 2000 at regional level. It contributes to the Brazilian and international literature in a number of ways.

First, this paper uses a Brazilian household-level data set (PME) only recently released for public use and not yet used for studies of the minimum wage in Brazil.

Second, this paper discusses a number of conceptual and identification questions as tentative explanations of the non-negative employment effects found in the literature. For example:

(1) A national minimum wage cannot explain variation in employment across regions (Brown et al., 1982; Card and Krueger, 1995; Burkhauser et al., 2000). Identification of the effect of the minimum wage separately from the effect of other variables on prices requires regional variation if no restriction on time modeling is imposed. This motivates the use of "spike" as a minimum wage variable, which is here argued to be superior to the commonly used "Kaitz index" and "fraction affected".

(2) Identification of the effect of the minimum wage separately from the effect of unobserved regional macro fixed effects on prices requires modeling fixed effects. This paper uses panel data techniques, scarce in the minimum wage literature, to account for this.

(3) The minimum wage variable and employment might be simultaneously determined. Identification of the effect of the minimum wage separately from the effect of unobserved variables on employment requires consistent estimation if such endogeneity bias is to be corrected for. Put differently, rather than capturing a descriptive relationship - which asks: *if a person is taken at random from the population, what is his/her expected hours of work, given the level of the minimum wage?* - the instrumented model captures a behavioural relationship - which asks: *if the same person is taken from the population, knowing which region he/she comes from (i.e., controlling for observed and unobserved regional effects), and the minimum wage is increased by 1%, by how much would his/her hours of work be expected to increase/decrease?* This paper suggests a number of political variables – not previously suggested in the literature - as excluded exogenous instruments to control for endogeneity.

(4) This paper formalizes an employment decomposition that separately estimates the hours worked and the number of jobs effects; if the first is positive and the second is negative, this could be an explanation of non-negative (total) employment effects. Such decomposition has not been previously formalized in the literature.

(5) This paper performs robustness checks accounting for sorting into the informal and public sectors, scarce in the literature. Again, if formal sector employment effects are negative and informal sector positive, this could be an explanation of non-negative (net) employment effects.

Third, this paper also contributes to the existing (mainly US) literature by estimating the minimum wage effects for a key non-US example. There are compelling reasons to study the minimum wage outside the US.

(1) "No single empirical study of an economic phenomenon is ever highly convincing" (Hamermesh, 2002, p. 4). Many data points are needed - many and independent data points are needed. This is an unbiased way of extending the understanding of minimum wage effects. Unfortunately, however, the international literature on minimum wage is scanty on non-US empirical evidence; using Brazilian data is a way of assessing the robustness of findings for the US. Hamermesh (2002, p. 15) argues for increased reliance on non-US data and policy evaluations: "policies like hours legislation and the minimum wage provide especially fruitful areas in which to apply the results of studying foreign experiences to the US".

(2) Hamermesh (2002) remarks that foreign experiences are especially fruitful if they generate exogenous shocks (an alternative to reliance on statistical methods to justify exogeneity), as is the case in Brazil over the past 30 years.

(3) Hamermesh (2002) calls attention for the evidence from developing countries, for example, Brazil. If the international literature is scanty on non-US empirical evidence, it is greatly lacking on developing countries.

(4) Minimum wage increases in Brazil are large and frequent, unlike the typically small increases focused upon in most of the literature (Deere et al, 1996; Hamermesh, 2002; Castillo-Freeman and Freeman (1992). Studying such increases allows a better possibility of observing the negative effects predicted by theory and thus the link between empirical data and the economic models of the minimum wage.

(5) Special features of the Brazilian Economy are valuable for case studies of the role of the minimum wage in presence of: a (low and) high inflation; a large informal market; a large proportion of minimum-wage-civil-servants; and a strong link between benefits and pensions, and the minimum wage. This unique data is a result of the very important role the minimum wage plays in Brazil – it has been used as an anti-inflation policy in addition to its traditional social role (Macedo and Garcia, 1978, 1979; Camargo, 1984; Foguel, 1997; Carneiro, 2000).

This paper is organized as follows. Section 2 presents the data. Section 3 describes the minimum wage in Brazil (Section 3.1) and discusses identification (Section 3.2). Section 4 estimates descriptive models. Section 5 further discusses identification: lags of the endogenous variable are used as instruments under the assumption of errors serially uncorrelated (Section 5.1); and political variables are used instead as exogenous excluded instruments when this assumption is relaxed (Section 5.2). Further robustness checks, accounting for sorting into informal (Section 6.1) and public sectors (Section 6.2) are performed. Robust results indicate moderately small employment effects.

2. DATA

The data used is from PME (Monthly Employment Survey). Between 1982 and 2000, PME interviewed over 21 million people across the six main Brazilian metropolitan regions: Bahia (BA), Pernambuco (PE), Rio de Janeiro (RJ), Sao Paulo (SP), Minas Gerais (MG) and Rio Grande do Sul (RS). Its monthly periodicity is important because wage bargains during the sample period occurred annually, bi-annually, quarterly and even monthly, depending on the inflation level and indexation rules. The deflator, INPC (National Consumers Price Index), was regionally disaggregated (IPC) to reduce measurement error.[2]

The data design is similar to the US CPS (Current Population Survey). Every household is interviewed in the first 4 months, not interviewed in the next 8, and again interviewed in the next 4 months. This guarantees (a) that 75% of the households are the same in any two consecutive months, and (b) that every two years 100% of the sample is repeated.[3] This scheme allows monthly, yearly, and seasonal comparisons (IBGE, 1983 and 1991).[4] Comparisons of demographic and economic characteristics across regions or waves show no selectivity bias in any direction (Neri, 1996).

3. MINIMUM WAGE VARIABLES

3.1 MINIMUM WAGE IN BRAZIL

The minimum wage was introduced in 1940 as a social policy to provide the minimum diet, transport, clothing, and hygiene for an adult worker. The price of this minimum basket varied across regions, which was reflected in 14 minimum wages - the highest (lowest) for the Southeast (Northeast) (Foguel, 1997). Wells (1983, p. 305) believes they were "generous relative to existing standards" since about 60% to 70% of workers earned below them. In contrast, Saboia (1984) and Oliveira (1981) believe they legitimated the low wages of the unskilled.

The minimum basket price was the criteria for the introduction of the minimum wage, but not for its adjustments. There are two main reasons for the erosion of the real minimum wage over time. The first one has been the failure in adjustments to keep pace with inflation. After a steep decrease, the real minimum wage was adjusted and reached its peak during the boom of the 50s, when productivity was high, unions strong, and the Government populist. After that, it decreased as a result of the subsequent recession, rising inflation, and non-aggressive unions (Singer, 1975). The real minimum wage was then 40% lower than in the 50s.

Its social role changed when the dictatorship installed in 1964 associated high inflation with wage adjustments. That is because minimum wage increases affect production costs and prices, not only through its direct effect on minimum wage workers, but also through indirect

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[2] Because IPC is centered on the 15th, and wages are usually paid on the 5th of the month, a geometric mean was used to center the IPC on 1st. See Neri (1995) and Azzoni et al. (1998) for deflator choices and deflation method in the presence of high inflation in Brazil (from 1982 to 2000, inflation was approximately 5,000,000,000,000%).

[3] The flow was twice interrupted: in August 1988, the sample was reduced by 20%, and in October 1993, the Census selected a new sample, fully implemented by January 1994. Thus, the panels are 100% different in January 1993 and January 1994. Furthermore, new sectors were selected whenever panels were exhausted, and households within sectors were substituted in areas of extreme violence.

[4] To perform such comparisons at an individual level, and because it was unavailable in the data, a panel identifier had to be constructed. The identifier is necessary because there is no guarantee that the same individual will live in the same house for 16 consecutive months or answer the 8 waves.

spillover effects (Brown, 1999). The dictatorship limited labour organization, reduced wage militancy, and implemented a centralized wage policy. One of the strategies of this policy was to control nominal increases (Macedo and Garcia, 1978); the minimum wage was transformed "from a social policy designed to protect the worker's living standard into an instrument for stabilization policy" (Camargo, 1984, p.19). According to Carneiro and Faria (1998), the minimum wage was used not only as a stabilization policy but also as a coordinator of the wage policy. One example of this role is that other wages were set as multiples of the minimum wage. Another example is that in the early 80s, wages in the range 1 to 3 minimum wages were bi-annually adjusted by 110% of the inflation rate; the higher the worker's position in the wage distribution, the lower the percentage adjustment. Such increases immediately spilled over higher up the wage distribution. The minimum wage then became an indexer; its effects were no longer limited to the bottom of the distribution as when it plays a social role.[5] In the presence of high inflation and distorted relative prices, rational agents take increases in the minimum wage as a signal for price and wage bargains - even after law forbade its indexer role in 1987.[6]

The second main reason for the erosion of the real minimum wage over time has been its impact on the public deficit - uncontrollably large and growing in the 80s and 90s - via benefits[7], pensions, and the Government wage bill (comprising a large proportion of minimum wage civil servants[8]). This has often been the criterion for the affordable increase in the minimum wage.

Because it affects both prices and the public deficit, the real minimum wage was decreased (by erosion of the nominal minimum wage) to control both, ultimately, to counter inflation. However, when pressure was enough, the Government had to give in, allowing increases in the nominal minimum wage, which in turn severely affected both prices and the public deficit; ultimately, raised inflation. This effect was perpetuated into an inflation spiral. The anti-inflation policy became inflationary itself; the remedy became the disease.[9] Thus, the minimum wage has been alternately used as social and anti-inflation policy in Brazil. The policy choice depended (a) on the level of inflation, (b) on the bargaining power of the workers, and (c) on the party affiliation of the Government (Velloso, 1988; Bacha, 1979). The social role is associated with more populist Governments, lower inflation, and stronger unions.

Graph 3.1a summarizes the hourly real minimum wage between 1982 and 2000.[10] Its highest level was in November 1982, before the acceleration of inflation, and its lowest level in

[5] The increase in inequality revealed in the 1970 Census was associated with the decreases in the minimum wage - the so called "Teoria do Farol" (Souza and Baltar, 1979, 1980a and 1980b; Wells; 1983, Bacha, 1979; Camargo, 1984; Saboia, 1983; Macedo and Garcia, 1978 and 1979).
[6] See Card and Krueger (1995) and Wolf and Nadiri (1981) on indexation and reinforced inflationary expectations.
[7] The Netherlands and Spain also have benefits linked to the minimum wage (Dolado et. al, 1997).
[8] In the sample period, 12% of the population are pensioners, 7% are civil servants.
[9] First, inflation eroded the real minimum wage and triggered nominal minimum wage bargains. Then the subsequent increase: (a) increased the public deficit, and (b) was a signal for price and wage bargains. Both these increased inflation, which in turn eroded the nominal minimum wage and triggered new nominal minimum wage bargains.
[10] The hourly minimum wage (wage) rate is the monthly minimum wage (earnings) divided by 44*4.3 after, and 48*4.3 before, the Constitution of 1988 (which shortened the working week from 48 to 44 hours).

August 1991.[11] In political terms, three events were important in the 80s: (a) in 1984, the minimum wage became national, after slow regional convergence; (b) with the end of the military regime in 1985, the 1988 Constitution re-defined the minimum basket as the minimum diet, accommodation, education, health, leisure, clothing, hygiene, transport, and retirement for an adult worker and his family - even though such a basket was unaffordable at the prevalent minimum wage; (c) the union movement re-emerged and became ever stronger, reaching a high union density for a developing country (Carneiro and Henley, 1998; Amadeo and Camargo, 1993). In economic terms, despite the political changes, the minimum wage was still a component of the centralized wage policy. The 80s and 90s witnessed an exhausting battle against inflation. Five stabilization plans between 1986 and 1994 erratically adjusted, - systematically decreasing - the minimum wage, depending on their indexation rules and inflation level. Since then, under reasonably stable inflation, the minimum wage has not been explicitly used as an anti-inflation policy.

3.2 IDENTIFICATION

Within a month, the minimum wage is a constant and therefore cannot explain variations in prices across regions. The real minimum wage varies across regions purely because the nominal minimum wage has been deflated with regional deflators. This variation cannot be regarded as genuine, as it is completely driven by the variation in the deflators; the effect of the inverse of the deflator on employment is what is ultimately estimated (Welch and Cunningham, 1978; Freeman, 1982). Lacking genuine regional variation, identification relies on time variation, which depends on restrictions on time effects - the so-called ad hoc identification, predominant in the early minimum wage literature. On the one hand, no restriction means to model time defining one dummy for each time period. This provokes perfect multicollinearity (Brown et al., 1982; Card and Krueger, 1995; Burkhauser et al., 2000; Dolado et al., 1997; Lee, 1999). On the other hand, full restriction means to model time defining a linear trend. This does not separate the effect of the minimum from the effect of other regional macro variables on employment.

Identification requires regional variation if no restriction on time is imposed. Many minimum wage variables with such a regional variation have been suggested in the literature. Graph 3.1b shows the typically used “Kaitz index” (Kaitz, 1970), defined as the ratio of the minimum wage to average wage adjusted for coverage of the legislation. The Kaitz index varies across regions and over time, but the above criticism applies: once the numerator is constant, the effect of the inverse of the average wages on employment is what is ultimately estimated. Other variables such as “fraction affected” and “spike” have also been suggested. Graph 3.1c shows fraction, i.e. the proportion of people earning a wage between the old and the new minimum wage (Card, 1992; and Card and Krueger, 1995), whose correlation with the real minimum wage is 0.57. While the fraction affected was 7.4% for the US in 1990 (Card and Krueger, 1995), it was 8% for Brazil, although as high as 49% in PE.

A well documented feature of the empirical wage distribution is the spike generated by the minimum wage (Card and Krueger, 1995; Brown, 1999). Graph 3.1d shows spike, i.e. the proportion of people earning one minimum wage (Dolado at al., 1997), whose correlation with

[11] At that time, there were two currencies in the country: Cruzeiros Reais and Real (URV). Inflation was much higher if measured in Cruzeiros Reais, as was the idea behind the Plan. Here, the inflation in Reais was corrected (by 21.99%) to account for the inflation in Cruzeiros Reais in July 1994.

the real minimum wage is 0.64.[12] Spike moves in response to the minimum wage, being bigger after a minimum wage increase and smaller as different categories have their salaries negotiated and are pulled out of the minimum wage (Card and Krueger, 1995). This is particularly remarkable in high inflation periods (Carmargo, 1984) - compare the spike and the saw-toothed pattern of the real minimum wage, also documented by Brown (1999) for the US. While the spike was 4% for the US in 1993 (Dolado, 1992), it was 12% for Brazil, although as high as 25% in PE, a poor region.[13]

Brown (1999, p. 2130) advocates that the 'degree of impact' measures (e.g., fraction affected) are conceptually cleaner than the 'relative minimum wage' variable (e.g., Kaitz index). He also notes that fraction affected is "not well-suited for studying periods when the minimum wage is constant, and so its impact should be declining. While there is more to be learned from a year in which the minimum wage increases by 10 or 15% more than average wages than from a year of modest decline, the periods between increases should together contain about as much information as the periods of increase." In other words, fraction is constant at zero regardless of how unimportant the minimum wage might become. As discussed thoroughly in Lemos (2002b), spike is superior to Kaitz index and fraction. On the one hand spike is conceptually related to fraction and is therefore methodologically clean; on the other hand spike does not suffer from the same drawback, as it can be defined even when the minimum wage is constant.

Once regional variation has been ensured, no restriction needs to be placed on time modeling. The typical annual data model in the literature includes year and regional dummies to model time and regional fixed effects (Brown, 1999). Intuitively, the month data version of this model would require month in place of the year dummies. However, that would eliminate all the variation in the model because each dummy would capture all that affects wages in each month - including the discrete minimum wage increases. As a result, there would be no variation but noise left to identify the minimum wage effect (Burkhauser et al., 2000). An alternative is to expect a relationship between both models. It is easy to show that the aggregated version of the month model is the typical annual model found in the literature - and therefore their parameters are related. In this sense, the month is no worse than the annual model. However, some might argue that despite the mathematical correspondence, year dummies alone are not sufficient to model time in a month model. In response to that, seasonal-month dummies to control for unobserved fixed effects across months are included as in Burkhauser et al. (2000). It is possible to include both (year and seasonal month dummies) because of the month-to-month (rather than the typical annual) variation in the minimum wage in most of the sample period in Brazil. Also, stabilization plan dummies are included to capture common macro shocks under each stabilization plan.[14] All these time dummies,

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[12] From March to June 1994 the minimum wage was fixed at 64.79 URV and converted into Cruzeiros Reais on the day of payment. To capture the spike, the MW_t is here converted by the average URV of the first 7 days of $month_{t+1}$, since by law MW_t must be paid at the latest on the 5^{th} working day of $month_{t+1}$ (CLT, art. 459, law 7855/89).

[13] Spike is here defined using real earnings as opposed to real hourly wages used in the Graphs 3.1c. Although the correlation between the two is high – the regression results below are robust to either definition - the first is bigger at every point in time because the labour market in Brazil functions on monthly basis and because of measurement error when defining spike using hourly real minimum wage.

[14] Each had very particular rules (Abreu, 1992) and thus macro shocks were similar within, and different across, plans.

namely year, seasonal-month, and stabilization plan dummies;[15] attempt to separate out the effect of other regional macro variables from the effect of the minimum wage on prices.[16]

4. DESCRIPTIVE MODELS

Changes in employment can be decomposed into changes in the number of jobs and changes in hours of work. Let average hours in the population ($\overline{T}$) be equal to the product of average hours for those working ($\overline{H}$) and the employment rate (E). Then, assuming that each of these three variables is a function of the minimum wage, total employment elasticity is equal to the hours plus job elasticities.[17]

As noted by Brown et al. (1982, p. 497), “to measure the employment effect of the minimum wage, the ratio of employment to population is used most often as the dependent variable”. However, the above decomposition suggests not only E, but also $\overline{T}$ and $\overline{H}$ as dependent variables; as a result, three specifications for the employment equation naturally arise. If a log-log or semi-log functional form is assumed, as it is common in employment models (Brown, 1999), and the set of regressors is the same, the additivity property of OLS holds and the estimate in the $\overline{T}$ model equals the sum of estimates in the $\overline{H}$ and E models. Although this issue has not received much attention in the literature (Barzel, 1973; Gramlich, 1976; Linneman, 1982; Brown et al., 1982; Brown, 1999), more recent research (Michl, 2000;

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[15] A dummy was defined in October 1988, when the new Constitution: (a) shortened the working week from 48 to 44 hours; and (b) introduced an alternative working day of 6 consecutive hours instead of 8 with 2 hours break.

[16] An F test was implemented to test whether these time dummies capture the relevant month variation. Consider two versions of the month model: (1) restricted - time is modeled by year, seasonal-month, stabilization plan, and structural break dummies; and (2) unrestricted - time is modeled by one dummy for each time period. Test F tests whether the restricted model is a good approximation of the fully saturated model; if most of the month variation is not being captured, the F test will fail the restricted model. Also, a more general Wald test (where the restricted is nested into the unrestricted model) is proposed to account for non iid errors. Both F and Wald tests rejected the restricted model; in the unrestricted model, the September dummies of each year were significant, even though a seasonal September dummy was included - it was the same for the January, May and November dummies of most years. Also, dummies coinciding with the implementation of the stabilization plan were significant, even though stabilization plan dummies were included. A hybrid model might be a compromise, adding dummies for January, May, September and November as well as for the month of implementation of each stabilization plan to the restricted model. However, before rejecting the restricted model, a Schwarz (likelihood) test for long T and short N panel data should be performed; Schwarz could be bigger for the restricted model even if restrictions are rejected on conventional tests. Despite these results the restricted version of the model is here reported, as the fully saturated model is not identified. Note the robustness of estimates to alternative specifications.
A similar procedure was used to test whether spike had variation over and above the time dummies to explain wages and employment. Both F and Wald tests rejected the restricted model; various time dummies in the unrestricted model were significant. This is reassuring that the variation captured by spike - further to that captured by the time dummies – is due to the minimum wage.

[17] More formally, $\overline{T} = \overline{H}E$ is $\frac{\sum_{i=1}^{N} hour_i}{N} = \frac{\sum_{i \in e}^{N} hour_i}{N_e} \frac{N_e}{N}$, where N_e and N are sample sizes of the employed and labour force and $hour$ is hours worked. Re-writing this equation as a function of the minimum wage, $\overline{T}(mw) = \overline{H}(mw)E(mw)$, differentiating with respect to the minimum wage and multiplying through by $\frac{mw}{\overline{H}E}$, the total employment elasticity is equal to the hours plus job elasticities: $\frac{\partial \overline{T}}{\partial mw}\frac{mw}{\overline{H}E} = \partial \overline{H} \; E \; mw + \partial E \; \overline{H} \; mw$

$\partial \overline{T} \; mw = \partial \overline{H} \; mw + \partial E \; mw$ $\quad \varepsilon_T = \varepsilon_H + \varepsilon_E$.

Zavodny, 2000; Card and Krueger, 1999; Neumark and Wascher, 1998) suggests that non-negative effects on jobs are sub-product of adjustments in hours. Ultimately, the signs of the hour and job effects depend on the production function and hiring and firing costs. Zavodny (2000) and Machin et al. (2002) estimate job and hours effects, but do not formalize it as a decomposition.

Each of these three specifications was estimated for four alternative LHS data filters, to account for Baker et al.'s (1999) criticism:[18] Within Groups (WG), OLS on the first-difference (FD), twelfth difference (TD) and on both first and twelfth differences (FTD). For each of these:

(1) Raw correlations, including past inflation, were estimated. On the one hand, the macroeconomic policy, including the minimum wage policy, was aimed at stabilizing the inflation; thus, inflation is driving other variables. On the other hand, the minimum wage was used as indexer (Section 3.1); thus, past inflation captures the portion of the minimum wage increase that merely compensates inflation.

(2) Regional and time dummies were included (see Section 3.2).

(3) Population and institutional variables that control for region specific demographics potentially correlated with the minimum wage are included: the proportion of workers in the population who are: young, younger than 10 years old, women, illiterates, retired, students, in the informal sector, in urban areas, in the public sector, in the building construction industry sector, in the metallurgic industry sector, basic education degree holders, high school degree holders, and the proportion of workers with a second job.[19]

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[18] Baker et al. (1999) attempt to reconcile the debate from the frequency domain approach. The appropriate data filter (short or long differencing) matters because the minimum wage effect is not constant across frequencies; negative or positive results are found depending on whether low or high frequency data is used. Card and Krueger (1995) found positive results using one and two-year-differencing (high frequency) whereas Neumark and Wascher (1992) found negative results using long differencing. Baker et al. (1999) argue that such conflicting results are a clear sign of mis-specification. (Also see Williams and Mills, 1998). In addition, differencing reduces variables to stationarity preventing spurius regression.

[19] There is some agreement that demand side variables should be held constant, but less agreement on whether supply side variables should be included as controls and, if so, which ones. The debate is about whether a reduced form or a demand equation is estimated, depending on whether the minimum wage is binding or not (Neumark and Wascher, 1992, 1995, 1996). For those who earn a minimum wage, employment is demand determined, but for those who earn more, relative supply and demand matter. Nevertheless, even if employment is demand determined, truly exogenous supply side variables do not bias the coefficient, although they do bring in inefficiency (Brown et al., 1982 and 1983). Typically, employment equations in the literature have been interpreted as demand equations, even though many include supply side variables (Card and Krueger, 1995).

Of particular concern is the inclusion of a variable measuring enrolment rates in school, which is jointly determined with - rather than an exogenous determinant of - employment, since schooling and working are alternative opportunities (Card and Krueger, 1995). Neumark and Wascher (1992) report results both excluding (omitted variable bias) and including (simultaneity bias) enrolment rate as a strategy to bracket the true minimum wage effect. Card and Krueger (1995) argue that if year and region effects are modeled, then excluding enrolment rate does not matter much. As claimed by Brown (1999), if minimum wage reduces both employment and enrolment, reduced form and enrolment rate constant employment equations have very different interpretations. If the minimum wage reduces school enrolment, this might be more important than adverse employment effects.

In Brazil, a large number of minimum wage workers are adults no longer at school. Also, schooling is largely available in the evenings, and therefore working and schooling need not be exclusive alternatives; if present, the simultaneity bias will not be as strong. Due to these particularities and the unresolved debate, enrolment rate was not here included (Williams, 1993; Baker, 1999).

(4) and (5) Finally, dynamics were added because an increase in the minimum wage might not affect employment contemporaneously but may do so in future periods. This is because the inability to adjust other inputs instantaneously creates lagged responses in employment (Brown, 1982; Neumark and Wascher, 1992; Hamermesh, 1995). Thus, dynamic models with 12 and 24 lags were estimated, once such large T on monthly data allowed for long dynamics.

By modeling regional and time fixed effects, including controls and lags, and differencing the data, the errors are no longer expected to be serially correlated. Neumark and Wascher (1992) also assume errors to be serially uncorrelated; few authors (Brown et al., 1983; Dolado et al., 1997; Burkhauser, 2000; Zavodny, 2000) worry about it (Brown, 1999). This variety of specifications embraces the typical specifications in the literature (Brown, 1999; Burkhauser et al., 1997; Card and Krueger, 1995; Neumark and Wascher, 1994; Nickell, 1986).[20]

Graph 4.1 plots log employment rate against log real minimum wage. The suggested positive raw correlation in levels fades as the data is differenced; this offers no support for a negative effect of the minimum wage on employment - if anything, the correlation is weakly positive.[21] Nonetheless, such raw correlations need to be proved robust when the effect of other variables (demand and supply shocks) on employment is controlled for. The specifications in Graph 4.2 and corresponding panel A of Table 4.A (in the appendix) begin with raw correlations and then add fixed effects, controls and dynamics (as discussed above). In line with the plots, such estimates also give little support for a negative effect: they are mostly positive, statistically significant, but small. The spike coefficient for the total employment model ranges from –0.036 to 0.779, decomposed into (a) the hours coefficient ranging from 0.173 to 0.844 (darker bars); and (b) the jobs coefficient ranging from -0.232 to 0.202 (lighter bars). An increase in the minimum wage sufficient to increase spike by 10 percentage points is associated with a decrease in employment of 0.04% at the most. Put differently, a 10% increase in the minimum wage in the sample period typically increases spike by 1%, which is associated with a decrease in total employment of 0.04% at the most. However, this is a correlation, rather than a behavioural elasticity, once the model is purely descriptive. Thus far only descriptive models have been estimated; the next step is an attempt to estimate behavioural effects rather than correlations.

5. ROBUSTNESS CHECK

To sum the identification discussion: (1) By using spike as a measure of the constant minimum wage, the effect of spike is not confounded with the effect of other regional macro variables on employment. (2) By accounting for regional fixed effects, the effect of spike is not confounded with the effect of unobserved regional macro fixed effects on employment. The last step is to control for simultaneity bias. (3) By correcting for simultaneity bias, the effect of spike is not confounded with the effect of unobserved regional macro variables on employment.

The nominal minimum wage is predetermined, but spike and employment are simultaneously determined. Once the minimum wage is increased, the relative wage bargains

[20] The errors are sample size weighted and White corrected. Heteroskedasticity arises from the aggregation per region because averages computed over a larger sample size have smaller variance. Incidentally, weighting captures the relative importance of each region to the (regional weighted) average coefficient if the sample size is proportional to the regional labour market (Card and Krueger 1995; Neumark and Wascher 1992; Baker at all. 1999). Note that PME is sometimes weighted by projections of population size.

[21] The plot of log hours worked against log real minimum wage follows a similar pattern.

determine the workers' position in the wages distribution; this also determines who earns one minimum wage, i.e. who is at the spike.[22] An exogenous or predetermined variable - that affects employment only via spike - is necessary to ensure identification. Lags of spike and political variables are proposed as such an instrumental variable.

The specifications of Section 4 are then instrumented. If the errors are assumed serially uncorrelated, lags of spike, naturally correlated with spike but uncorrelated with the error term, fulfill the properties of a valid instrument. Panel B of Table 4.A shows estimates, not always significant, of magnitude and signs not too different from the uninstrumented versions of Section 4. The total employment elasticity ranges from -0.327 to 0.956, decomposed into (a) hours elasticity, ranging from -0.158 to 0.975; and (b) jobs elasticity, ranging from -0.306 to 0.312. Other things constant, increasing the minimum wage by 10% (increases spike by 1%) decreases employment by 0.3% at the most.

5.1 SERIAL CORRELATION

If serial correlation is relaxed, the structure of the errors is crucial in defining which - if any - lag of the endogenous variable can be used as a valid instrument. Assuming serial correlation due to mis-specified dependent variable dynamics, as its lags are included as regressors, serial correlation is expected to vanish. In this sense, the Sargan test can be used as a model selection criterion, indicating which dynamics generate serially uncorrelated errors and validates lags (of the endogenous variable) as instruments (Andrews, 1999; Szroeter, 2000). Ultimately, an orthogonality condition must be made to produce an estimable equation and it is not too unrealistic to assume that serial correlation will vanish after differencing, adding dynamics, controls, regional and time dummies.

This was the idea in Section 5. Table 5.A (in the Appendix) shows the associated overidentifying restrictions (Sargan) test, Hausman test and F test (in the first step of the 2SLS) for the models in Table 4.A. The Hausman test shows endogeneity, as anticipated in Section 3.3, the F test shows the instruments performed well, but the Sargan test fails even in the dynamic models – this invalidates lags of spike as instruments.[23] Only an excluded instrument with truly exogenous variation, uncorrelated with the error term and all its past lags, will ensure consistency. Political variables were used in an attempt to define such an instrument.

5.2 EXCLUDED EXOGENEOUS INSTRUMENTS

Three different sources of political variables are used as instruments (see Appendix A and Table 5.1 for institutional details and correlations):

Politicians Data - It is well established in the politics of the minimum wage literature that politicians might favor or oppose minimum wage increases depending on the overall

[22] The nominal minimum wage might be endogeneous if its increases are related to regional macroeconomic performance (Card and Krueger, 1995; Dolato et al., 1997; William and Mills, 1998). Further endogeneity can be caused by the denominator of the real minimum wage, i.e. price or (average) wage deflators (Dolado et al, 1997; Zavodny, 2000). The most obvious instruments for spike are lagged real minimum wage and lagged Kaitz index along with lagged spike. However, (a) they do not ensure identification, as discussed in Section 3.2; and (b) they suffer from the same drawback as spike when serial correlation is relaxed (see Section 5.1). Despite of that, robustness checks using such instruments produced robust estimates.

[23] Tentative explanations for persistent serial correlation are: month dynamics modeling, "indexation serial correlation memory", and omitted independent variable dynamics.

macroeconomic performance in each region. The final increase is a regional weighted average; the impact of the increase in each region determines the political support (the relative weight) of that region to the increase – which ultimately determines spike. In Brazil, the Intersyndical Department of Parliamentary Consultancy (DIAP) attributes marks to politicians for each vote favoring workers in workers related bills and ranks the most influential congressmen. The more such congressmen from a particular region, the more weight on the interests (group interests) of that region. Put differently, the more pro-increase (contra-increase) influential congressmen, the higher (lower) the minimum wage. These are personal characteristics and there is no reason to believe they are endogeneously determined with employment.

Voting Data - Some might argue that voting data would measure the regional weight more directly associated with minimum wage increases. Card and Krueger (1995) used voting data to construct a measure of political support. Similar data was collected for Brazil from the National Congress Daily (Diario do Congresso Nacional, DCN). As an attempt to further measure the political bargaining process, data was collected on bills never submitted to voting, on the commissions formed to appreciate bills, and on the speeches of congressmen. As discussed in Section 5, minimum wage increases are here assumed predetermined - and so must be the underlying voting. Those who regard the potential correlation with past information as a source of endogeneity can regard this as a robustness check where the "more endogeneous" spike is exchanged by the "less endogeneous" instrument. Whereas these instruments might be contaminated with some endogeneity, this is negligible in the next set of instruments, once elections only happen every 4 years, and it is certainly not the case in the previous set of instrument. An interesting feature of voting data is that voting can be non-secret (nominal), secret, or party oriented. During the dictatorship there was no voting, and when there was, it was symbolic - this is an exogeneous instrument in itself.

Election Data - However, regional affordability is not the only criterion for political support. As an attempt to collect data with independent variation to further test the robustness of the estimates, consider political propaganda. First assume that incentives for more generous increases depend on the proximity of elections; the closer the elections, the higher the minimum wage. Further, assume that left-wing politicians are in favor of more generous increases. The lower the minimum wage, the more dissatisfied people, and the more left-wing politicians elected. Data on the number (proportion) of votes for left-wing candidates and on the political cycle was used as instruments.

The full set of results for the above groups of instruments is reported in the corresponding panels of Table 4.A. The estimates are still clustered around zero but larger than before in absolute terms. Estimates are both smaller and more significant in panels C to E and larger when interaction instruments were used in the base specification in panels F to J, but are not always significant. Table 5.2 shows that the total employment elasticity ranges from -2.50 to 4.01, decomposed into (a) hours elasticity, ranging from -2.24 to 3.49; and (b) jobs elasticity, ranging from -2.59 to 1.71. Holding other things constant, increasing the minimum wage by 10% (increases spike by 1%) decreases employment by 2.6% at the most. Table 5.2 presents the interval that brackets the effect of a 10% increase in the minimum wage across models and variables. Finally, the last two columns of Table 4.A also show a less than 2.5% employment decrease in the long run.

A preferred specification is not chosen; instead, the range of estimates produced is expected to embrace the true coefficient. If a preferred specification was to be chosen, it would be the more complete specifications (including fixed and regional effects, controls and dynamics[24]) in first differences (FD and TFD), instrumented with raw political variables - i.e., columns 4 and 5, rows FD and TD, of panels C to E. These models are expected to produce errors serially uncorrelated, but even if they do not, the political instruments ensure consistency through the less debatable set of (non-interacted) instruments. Specifications in panels D and E perform better in the overall tests: (1) These specifications produce the most robust estimates; (2) Some endogeneity could not be rejected according to the Hausman test, as above; (3) the Sargan test did not fail in FD and TD for dynamic models, as expected; and (4) the F test showed the fairly high explanatory power of the instruments. Thus, these specifications are more reliable both conceptually and statistically. Incidentally this "preferred" specification - narrowing down to the elite instruments in panel D, row FD, column 5 - produces estimates fairly similar to the other specifications. That is, ultimately, the argument for not choosing a preferred specification.

Bracketing the employment elasticity below 3% across such a variety of models is reassuring; considering estimates from the preferred specification only, this number goes down to 0.3%, the same figure found in Sections 4 and 5 above - which is even more reassuring. These results were fairly robust to changes in the specification and to various alternative instruments. There is always room for criticisms on instruments, which are always very hard to find in economics. These were aimed only at checking the robustness of the results. Indeed, whatever the specification, the results are pretty much the same. They are also in line with the international and Brazilian literature; Camargo (1984), Velloso (1988), Neri (1997), Foguel (1997), Carneiro (2000) and Lemos (2002), among others, also found small (non-significant) adverse employment effects for Brazil.

All the above pieces of evidence suggest that an increase in the minimum wage does not always have a significant effect on employment and it is not always negative; a cautious reading is that the minimum wage has small adverse effects on employment. Regarding the above as demand equations, this is consistent with a fairly inelastic demand curve: minimum wage increases translate into small employment losses (Freeman, 1995).[25]

6. FURTHER ROBUSTNESS CHECKS

6.1 FORMAL AND INFORMAL SECTORS

Assuming (a) no sorting by wages into formal and informal sectors (random assignment); and (b) full compliance with the same minimum wage law in both sectors; the wage distributions would look identical and the effects of the minimum wage on wages would be the same in both sectors; i.e., the null $\beta = \beta_F = \beta_I$ should not be rejected. Further assuming (c) the same labour demand elasticity in both sectors, the effects of the minimum wage on employment would be the same in both sectors.

If any of these assumptions is relaxed, the effect of the minimum wage could differ across sectors. First, if individuals with particular characteristics sort themselves into one or another sector, as not all such characteristics are observed, correlation between the observables and

[24] As employment is expected to be AR(2) using annual data (Layard et al., 1991), then the dynamic specification including 24 lags of employment using monthly data is more reliable.

[25] Barros et al. (2002) also estimated a fairly inelastic labour demand for the industry sector in Brazil using panel data techniques; the elasticities vary across specifications from 0.0 to –0.3.

unobservables could contaminate the coefficients with endogeneity bias. Even though the underlying coefficients could still be the same, the null hypothesis of equal coefficients could be incorrectly rejected because of the bias.[26] Second, even if there is no sorting, compliance with the law might only take place in the formal sector. Third, even in presence of no sorting and full compliance in both sectors, the employment response to the minimum wage might differ if the labour demand elasticities are relatively different across sectors.

The standard Welch-Gramlich-Mincer Two Sector Model major prediction is that the uncovered sector wages fall as a result of formal sector displaced workers moving into informal sector employment. It follows that a spike should not be observed in the uncovered sector wage distribution (Brown, 1999; Card and Krueger, 1995; Welch, 1976; Gramlich, 1976; Mincer, 1976). If additionally labour supply is assumed inelastic, the uncovered sector employment increase is just enough to off set the formal sector employment decrease ($\beta_F = -\beta_I$) and the net (full sample) employment effect is zero.[27] In this case, it is important to investigate the covered and uncovered sector coefficients underlying the net coefficient - especially if the uncovered sector is large.

The predictions of the Two Sectors Model follow from the assumption of non-coverage. The Brazilian informal market suffers from non-compliance not non-coverage. That is the key difference between the US literature on the effects of the minimum wage in the uncovered sector and the Brazilian literature on the effects of the minimum wage in the informal sector. Informal sector wages and employment need not and will not respond to an increase in the minimum wage in the same way uncovered sector wages and employment respond.

Graph 6.1I (and corresponding panels 1 and 2 of Table 6.A in the Appendix) presents estimates of the coefficients of the employment effect by sector using the preferred specification (as argued in Section 5.2.4).[28] The pattern of signs, significance, and magnitudes are remarkably similar in both sectors.[29] The null hypothesis of identical employment effects could not be rejected across 30 specifications (except one, where the estimates are not significant individually; incidentally, the most incomplete specification).[30]

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[26] An ingenious method to prevent this, where an excluded exogenous instrument is not crucial, is aggregation by cohort as in Meghir and Whitehouse (1996), Blundell, et al. (1998), Angrist (1991), Browning et al. (1985), Deaton (1985), and Attanazio and Browning (1985).

[27] Incidentally, this might offer an explanation for the clustered around zero net employment effect found in the literature if the labour supply is relatively inelastic; Brown (1999), however, finds rather implausible the associated large fall in the informal sector wages.

[28] These are to be compared with the estimates in columns 4 and 5, rows FD and TD, of panel A in Table 4.A.

[29] Because the full sample employment rate (hours worked) is equal to the sum of the formal and informal sectors employment rate (hours worked), the OLS additivity guarantees that $\beta = \beta_F + \beta_I$. However, for consistency throughout the paper, here also the models were specified in logs to guarantee that $\beta_T = \beta_H + \beta_E$ (see Section IV.1). Because the log of full sample employment rate (hours worked) is no longer equal to the sum of the log of formal and informal sectors employment rate (hours worked), $\beta = \beta_F + \beta_I$ no longer holds. This is a technical issue that has no further implications; the functional form does not change the estimates magnitudes significantly, and it does not change their signs at all. Also note that, in line with previous work for Brazil (Menezes-Filho et al., 2002; Tannuri-Pianto and Pianto, 2002; Carneiro and Henley, 2002), the self-employed were dropped because the design of the survey does not allow their classification into formal or informal sector workers.

[30] Sorting, compliance, and labour demand elasticities, as discussed above, do not seem to be a matter of concern. (1) There might be some endogeneity, but not enough to contaminate the results as to reject the null. (2) There might be some non-compliance, but on other aspects of the labour contract, such as social security taxes, paid holidays, health insurance, etc. (Amadeo et al., 1995); the presence of a spike in both sectors (Lemos, 2002)

These results are not surprising and are rather reassuring of other features of the data. First, a large spike is observed in the earnings distribution of both sectors, as documented by Lemos (2002), Neri (1997) and Foguel (1997) for Brazil. Card and Krueger (1995) and Brown (1999) also document a spike in the uncovered sector for the US. If the minimum wage is binding in both sectors, employment should decrease in both sectors. Second, spillover effects in both sectors - more robust for the informal sector, the so-called "Efeito Farol" (see Section 3.1) – was reported by Lemos (2002), Neri (1997), Foguel (1997), Neri et al. (1999) and Carneiro (2000) for Brazil, even though Velloso's (1988) inconclusive and Carneiro's (2000) positive informal employment effect is at odds with the "Efeito Farol". If wages increase in both sectors, employment should decrease in both sectors. Mincer (1976) note that the prediction of uncovered sector wages fall is not robust to alternative assumptions on sectoral choice and unemployment; Card and Krueger (1995) show that the uncovered sector wages rise (and employment falls) if the covered sector labour demand is relatively inelastic.[31]

Thus, the presence of a spike and spillover effects in both sectors is consistent with the negative employment effects found in both sectors (see Graph 6.1Ic). This is also consistent with the positive unemployment effects documented in Graph 6.1Id and in line with findings for Brazil by Lemos (2002), Foguel (1997), Neri (1997), and Neri et al. (1999). This is reassuring of the net (full sample) employment effects from Section 5. The robustness checks for the formal and informal sectors therefore are not sufficiently strong to change the previous conclusions.

6.2 PRIVATE AND PUBLIC SECTORS

The employment effects predicted by the neoclassical model relies on a profit maximizing firm, not on a government employer that can cover the higher wage bill by raising taxes, reducing expenditure, or simply printing money, as in Brazil (see Section 3.1). This is not to claim there will be no adverse employment effect in the public sector; even though they are not predicted by an specific theory, Hamermesh (1993) notes that institutional differences in developing countries do not require changes in the basic theory of labour demand.

However, because evidence regarding the private sector need not carry over to the public sector, the same sort of robustness check carried out for the formal and informal sectors in Section 6.1 is performed for the private and public sectors. Investigating the public sector employment effects is particularly relevant if the public sector, as in Brazil, is overpopulated by minimum wage workers and has no negligible spillover effects (Lemos, 2002).

Graph 6.1II (and corresponding panels 3 and 4 of Table 6.A in the Appendix) presents the estimates. Once again the pattern of signs and magnitudes are similar in both sectors, even though the public sector estimates are not as robust. The null hypothesis of identical

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suggests that the effective pay (the minimum wage) taken home is the same in both sectors. Further non-compliance - workers earning below the minimum wage - is present, but even there spillover effects are documented (Lemos, 2002). The presence of spike is evidence against non-compliance in the sense of absence of minimum wage workers. Reis (1989) reports that non-compliance in Brazil is higher among the women, the less educated, the youngsters, in the service sectors, and in the poorest regions. See Ashenfelter and Smith (1979) and Card and Krueger (1995) for non-compliance. (3) The labour demand elasticities might differ across sectors, but not as much as to drive the null to be rejected.

[31] The labour demand for the industry (mainly formal sector firms) in Brazil is fairly inelastic (Barros et al., 2002); no estimates of the informal sector labour demand elasticity was found to be available for Brazil.

employment effects could not be rejected across 30 specifications (admittedly, in a few cases, this might be due to large standard errors). Nevertheless, once again, the robustness checks for the private and public sectors are not sufficiently strong to change the previous conclusions. This is in line with findings by Lemos (2002).

7. CONCLUSION

This paper contributes to the existing (mainly US) literature by estimating the minimum wage effects on employment for a key non-US example. Brazil's minimum wage policy is a distinctive and central feature of the Brazilian economy. Not only are increases in the minimum wage large and frequent, but also the minimum wage has been used as anti-inflation policy in addition to its social role. It affects employment directly and indirectly, through wages, pensions, benefits, inflation, the informal sector, and the public deficit. This confirms the importance of studying the minimum wage in Brazil.

This paper also contributes to the literature by discussing a number of conceptual and identification questions as tentative explanation of the non-negative employment effects recently found in the literature. This effect was exhaustively measured using a variety of specifications, instruments, and estimation techniques.

Evidence of a moderately small adverse effect was uncovered and shown to be robust to many specification changes and tests. This small effect, clustered around zero, is in line with more recent international and Brazilian empirical literature.

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APPENDIX A – DEFINING EXCLUDED EXOGENEOUS INSTRUMENTS

A.1 Politicians Data

As discussed in Section 3.3, the intuition for the “degree of impact” variables is that a national minimum wage increase affects a different proportion of people across regions depending on the overall macroeconomic performance in each region. Similarly, the intuition for the political variable instrument is that the underlying political bargaining process for the increase implicitly accounts for the overall macroeconomic performance in each region. Card and Krueger (1995, p. 134) argue that “Politicians from states in which an increase in the minimum wage is expected to have a strong effect on wages or employment opportunities might oppose the increase, whereas those from states in which the expected effect is smaller might support it." In Brazil, not only the direct, but also the indirect effect on employment via wages, pensions, benefits, inflation, informal sector, and the public deficit is on politicians' minds. The final increase is a regional weighted average. Becker (1983) argues that policy is the result of compromise between competing interest groups (regions); what matters is their relative strength. The impact of the increase in each region determines the political support (the relative weight) of that region to the increase – which ultimately determines spike. Thus, political support and spike are correlated.[32]

In Brazil, the Intersyndical Department of Parliamentary Consultancy (DIAP) ranks the 100 most influential congressmen in the country according to political science criterion (debating, negotiating, voting, articulating, forming opinion, leading, etc.) which enables them to have their ideas and beliefs prevalent in the bargaining process (DIAP, 2001). These are personal characteristics and there is no reason to believe they are endogeneously determined with employment. The more such congressmen from a particular region, the more weight on the interests (group interests) of that region. Sobel (1999) argues that interest group pressure significantly influenced congressional voting on the passage of the minimum wage bills in the US.[33] DIAP's rank is then a measure of regional weight and was here defined as an instrument (IV1). The more pro-increase (contra-increase) influential congressmen, the higher (lower) the minimum wage. This can drive the correlation with real minimum wage to be either positive or negative, depending on the political context. However, Table 5.1 shows a strong positive correlation (0.62), which suggests a fairly stable correlation over the sample period.[34] DIAP's rank was also re-defined as a proportion of congressmen from the sampled regions (BA, PE, MG, RJ, SP and RS), which did not change the sign of the correlations (IV2).

DIAP also attributes marks to politicians for each vote favouring workers in workers related bills. The following, due to specificities of the socio-economic-political process in Brazil, were selected by DIAP as such bills: wage, pension and benefits increases; land reform; permanent tenure of civil servants; union leader permanent tenure; subsoil nationalization; unfair dismissal; petroleum state monopoly; non-reductible wages; presidencialism and republic as a systems of government; temporary redundancy; work week shortening; centralized union organization; 30 days minimum notice; centralized union organization; conditions of retirement; paid holidays; maternity leave; workers representative to company management; progressive tax bands; central bank independence; Christmas bonus; direct presidential elections; president mandate length; striking rights; political administrative reform; new constitution; voluntary union contribution; president re-election; presidential decrees re-edition; redundancy and dismissals legal process subject to union check; secret vote; public and

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[32] Assume two regions only in the country: a poor one, where spike is positive and large; and a rich one, where spike is zero. If the poor region's proposed increase has the majority of votes when voting the national bill, the weight on the rich region's increase is zero and the final increase is determined by what the poor region can afford. In practice, the weights are somewhere between 0 and 1.

[33] Sobel (1999) rejects the hypothesis that the minimum wage policy in the US has been driven to achieve what he calls its "most popularly stated goals" (i.e. lifting the family of a typical minimum wage worker out of poverty, and maximizing her/his earnings). He argues that an interest group model best explains the historic path of the minimum wage; he shows that union membership and the top marginal corporate income tax rate, as measures of the political power of labour and business, are correlated with the minimum wage.

[34] It is intuitively easier to discuss the sign of the correlation in relation to the real minimum wage even though these are instruments for spike. Both correlations should bare the same sign, once spike and real minimum wage are themselves positively correlated (see Section 3.3); there are very few cases (indicated in the text) where this is not verified empirically.

free high education; private and public health insurance and pension schemes, etc. [35] A number of these are clearly not endogeneously determined with employment; this should dilute the endogeneity of those which are. In other words, a considerable part of the variation is not simultaneously determined with employment. A version of this instrument including solely the marks for bills not simultaneously determined with employment was defined; the estimates were robust to either definition. The average mark for each region is a measure of how pro-workers (pro-increase) that region is (IV3); the higher the mark, the higher the minimum wage. Table 5.1 confirms a strong positive correlation with the real minimum wage, but not with spike.[36]

The above instruments (see Panel I of Table 5.1) are strongly correlated with spike but not thought to be simultaneously determined with employment. Incidentally, the Sargan test did not fail the specifications using such instruments (see Table 5.A).

A.2 Voting Data

Some might argue that voting data would measure the regional weight more directly associated with minimum wage increases. Card and Krueger (1995) used voting data to construct a measure of political support. Similar data was collected for Brazil from the National Congress Daily (Diario do Congresso Nacional, DCN).[37] The number of congressmen votes in favour (IV8 and IV9), against (IV10 and IV11) and absent (IV12 and IV13) in each minimum wage bill during the sample period were collected in both the Federal Senate and the Deputy Chamber. Usually, pressure against the bill (pressure for no increase or a smaller increase) results in inflation erosion of the real minimum wage (Sobel, 1999). In Brazil, there are two distinct reasons to oppose the increase. In line with the above, pressure against the increase might mean that the increase cannot be afforded; this argument is usually related to the inflation impact or public deficit impact of the increase (see Section 3.1). In contrast, pressure against the increase might mean that the increase is not large enough to even maintain the minimum wage purchase power; this argument is usually related to protecting the worker's standard of living. Examples of both arguments can be found in the newspapers:

> "The Government makes the minimum wage increase conditional upon the inflation level, the benefits and pension bill, the Estates and Cities finances… Most Congressmen know that a big increase would put at risk the economic stability of the country." (Estadao, 15th Januray, 1998).

> "The minimum wage increase affected inflation… but the time is long gone when the increase would spread through the whole Economy, like the petrol increase" (Estadao, 13th May, 2000).

> "…congressmen are worried about finding the resources to afford the bill at the federal level, but have forgotten the municipal level… increasing the minimum wage to R$200 would increase the wage bill of most small and medium towns of the Northeast by 7.8%, where 60% to 70% of civil servants receive one minimum wage… if they do not find resources at a municipal level, mayors will have to fire civil servants" (Estadao, 11th December, 2001).

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[35] For a full and detailed list, see DIAP (1986, 1990, 1994, 2002. These publications are not part of a series; they have slightly different methodologies (some adjustment had to be made). But the main idea is the same – grading politicians on how worker sympathetic they are.

[36] Dummies were also defined for whether these politicians are left or right wing, whether or not they hold a degree, and the number of mandates they hold (IV4 to IV6), which were then interacted (IV7).

[37] Minimum wage increase laws are published in the Official National Daily (Diario Oficial da Uniao, DOU), which indicates the associated DCN, where the debate and final votes are published.

"…to buy the same basket as in 1940, when it was introduced, the minimum wage would have to be R$517.55 [as opposed to the current R$130]" (Estadao, 10th May, 1998).

The underlying reason for being against the increase will depend on the political and economic context, party affiliation and workers' bargaining power, which naturally vary over time. As discussed in Section 3.1, the centralized wage policy was designed to control inflation and the public deficit via minimum wage increases; Graph 3.1 shows supporting evidence of the resulting steady decrease. It is hard to think that being against these increases is being in favour of even smaller increases; it is more plausible to think that opposing such a policy meant favouring protection of the worker's living standard. Thus, the more congressmen against the increase, the more pressure for a bigger increase, and the higher the minimum wage. Absence (not justifiable absence through sickness, official mission, etc.) is also important because it might be a strategy against the passage of the bill (see below). Table 5.1 shows strong negative correlations, although a positive sign was expected for IV10 and IV11. This is either because of the underlying reason for opposing the increase, which can effectively drive the correlation to be negative or positive; or because of the definition of the instrument as "number" rather than "proportion". The number of congressmen both in favour and against the increase can move in the same direction as the minimum wage, but the proportions are not expected to. Thus, proportions were defined (IV14 to IV17), but the sign did not change. Although IV15 and IV16 bare a negative sign, the correlations are robust across definitions and variables – they cannot have happened by chance alone. Most importantly, there is plausible economic reasoning for either a positive or a negative correlation. Provided the correlation is reliable – nonzero and stable over time - it suffices to establish a robust correlation.

There is no reason to believe that at the time politicians are voting the bill this is having a simultaneous effect on employment. Card and Krueger (1995, p. 135), however, used their political variable as a "proxy for otherwise unobservable factors in a state that might be related to the impact of the law", implicitly assuming a direct effect on employment over and above the indirect minimum wage effect. As discussed in Section 5, minimum wage increases are here assumed predetermined - and so must be the underlying voting. Those who regard the potential correlation with past information as a source of endogeneity should also regard this as a robustness check where the "more endogeneous" spike is exchanged by the "less endogeneous" instrument. Whereas the above instruments might be contaminated with some endogeneity, this is negligible in the next set of instruments (Section 5.2.3), once elections only happen every 4 years, and it is certainly not the case in the previous set of instrument (Section 5.2.1).

An interesting feature is that voting can be non-secret (nominal), secret, or party oriented. During the dictatorship there was no voting, and when there was, it was symbolic - this is an exogeneous instrument in itself. Parties orient the vote prior to voting; non-secret votes (only on demand) are usually a strategy of those opposing the increase (favouring a bigger increase) to expose their opponents. For example:

"The popular movement against the minimum wage of R$151 toughens up in Brasilia on Easter, when a circus tent will be installed in front of the Congress to shelter 1,000 retired workers who will camp there until voting on the bill on the 26th. The vigil will include a mass for the "conversion" of deputiess and senators in favour of a more generous minimum wage… The organizers of the movement [the Labour Party] want to install panels with the names of the Congressmen and their intentions of votes in Rio and Sao Paulo… as well as large screens for the people to watch the voting live" (Estadao, 19th April, 2000).

"In a convoluted session stretching until early morning, the Government got the Congress to approve the R$151 minimum wage… after 3 months of fighting and thanks to a full day of intense lobbying. The session, due to start at 7pm, was postponed to 8pm, to prevent voting going live on television, exposing the 'situation' Congressmen [those in favour of the R$151 Government proposal] …who did not succeed in making a deal for symbolic voting, which guarantees the anonymity of votes. The opposition Congressmen… insisted on nominal voting". (Estadao, 11th May, 2000). "By determination of the president… the general secretary will list the names of the Congressmen who will be punished for voting against the Government." (Estadao, 12th May, 2000).

"The increasing tension between allies and adversaries of the Government because of the difficulties in finding a solution to the minimum wage increase might stop the voting… the leader of the Labour Party… announced yesterday that his party will be absent" (Estadao, 9th November, 2000).

The lower the minimum wage, the more pressure for a bigger increase, and the more often non-secret votes are demanded. Thus, a dummy (3 for non-secret, 2 for party oriented and 1 for secret/symbolic vote) was defined for the Federal Senate and Deputy Chamber (IV18 and IV19) to account for a) data reliability, b) pressure strategies, and c) democracy level. Table 5.1 shows strong correlations and the expected negative sign. Block (1980 and 1989) and Card and Krueger (1995) discuss party influence on the passage of minimum wage bills in the US. Weighting the number and proportion of votes by the voting dummy is a natural step (IV20 to IV29). This places more weight on the more reliable non-secret votes data as well as on more proactive pro-increase and democratic times. Table 5.1 shows strong negative correlations. Incidentally, this interaction dilutes the potential endogeneity discussed above, as it introduces exogeneous variation in the instrument definition.

Another way to measure the political bargaining process is to consider the frequency of increases. An increase occurred whenever the socio-economic-political tension for it became unbearable (81/217 months); tension in the month immediately after the increase is low, reaching its peak the month before the next increase. The timing of the increases was regarded as a measure of tension and used to define a "voting cycle" variable (IV30).[38] The more often bills are needed, the lower the minimum wage (the faster was its inflation erosion). Table 5.1 shows strong correlations and the expected positive sign. The voting cycle is assumed to be predetermined, as tension at each moment is a function of past information;[39] therefore, some might argue that this instrument suffers from the same drawback as voting data discussed above.

Weighting the voting data by the voting cycle generates a political variable that measures regional political support over time (IV35 to IV50). This places more weight on voting when it is most relevant (has just occurred), and less weight when the tension is such that new voting is imminent. Weighting is also expected to improve the instruments performance - it produces variation across regions and over time - although Table 5.1 shows the correlations to be again strong and negative, but not stronger.

The above instruments (see Panel II of Table 5.1) are strongly correlated to spike but not thought to be endogeneously determined with employment. Furthermore, the Sargan test - here regarded as a serial correlation test - did not fail the specifications using such instruments (see Table 5.A). This is supportive of the assumption that any correlation with past information is not too strong.

[38] Tension can only be measured when it reaches its peak triggering an increase. Assuming that tension grows linearly, the voting cycle was defined as a linear (exponential, squared, squared root and log were also experimented, IV31 to IV34) time trend between each of the two increases.

[39] Because the voting cycle was defined as a trend between each of the two increases, some might argue that this introduces some kind of "future endogeneity" in the model - agents would have accurate predictions of when tension broke into an increase. However, such peaks were unknown at the time, and are ex-post observed.

As an attempt to further measure the political bargaining process, data was collected on bills never submitted to voting, on the commissions formed to appreciate bills, and on the speeches of congressmen. Data on bills submitted by congressmen from the sampled regions to the Federal Senate and the Deputy Chamber was collected: the number of minimum wage bills (IV51), by left-wing[40] congressmen (IV52), and the number of minimum wage increase bills (IV53). The more bills needed, the lower the minimum wage. Table 5.1 shows strong negative correlations, as expected. For the same reasons as before, the last two instruments were defined as proportions of the first one (IV54 and IV55), which again did not change the sign of the correlation. Also, a dummy was defined for whether the bill was or was not effective (never voted) (IV56). The more effective the bills, the higher (less inflation eroded) the minimum wage. Table 5.1 confirms the expected positive correlation. Two more variables were defined to measure the length of the passage of the bill: a) sum of days (if more than one bill per month) (IV57), and b) average days (IV58). The longer the passage, the more pressure (the less bargaining power), the higher (lower) the minimum wage. The correlation sign will depend on the underlying reason for the delay, but it should be the same for both spike and real minimum wage. Table 5.1 shows that the signs differ. This is either because of no genuine correlation (indeed the correlations are low) or because of measurement error. Regarding the latter, this data was collected from the National Congress System Information (SICON) on the internet, and (a subsample) checked against data from the Section for Parliamentary Information (SEDOP) in the National Congress. The data is assumed to be reliable and measurement error negligible (IV51 to IV53 show strong correlations).[41]

Data was also collected on the number of speeches by congressmen from the sampled regions in both the Federal Senate and the Deputy Chamber regarding the minimum wage (IV62), by left-wing congressmen (IV63), regarding a minimum wage increase (IV64), in favour (IV65) and against the increase (IV66). The more speeches needed, the lower the minimum wage. Table 5.1 confirms the expected negative correlations. This data was collected from the Shorthand Notes from the National Congress Sessions (and associated DCN); it is assumed to be reliable and the measurement error negligible for the first three, but not for the last two instruments. This is because the last two are subject to interpretation, aggravated by the complex socio-economic-political Brazilian context and by the number of variables affected by the minimum wage. Once more the last four instruments were defined as proportions of the first (IV67-IV70), and once more the sign of the correlation remained unchanged.

For most of the bills submitted, a commission would appreciate the impact of the increase prior to voting. Data on the (total, left and right-wing) number of congressmen from the sampled regions in each commission was collected (IV71 to IV73). The more congressmen in favour of the increase, the lower the minimum wage, as before. Table 5.1 shows negative correlations, even though a positive sign was expected for IV73, as before. Once more, proportions were defined (IV74 to IV77), which did not change the sign of the correlations with real minimum wage, but turned into positive the correlations with spike. As before, this is either because of no genuine correlation (indeed correlations are low) or because of measurement error. Regarding the latter, this data was collected from the SICON, and checked against the SEDOP, as before, and is assumed to be reliable. However, measurement error is

[40] Left wing designation according to Figueiredo and Linomgi (1995).
[41] Also, the number of bills was weighted by the "effectiveness" (IV59) and "length" dummies (IV60 and IV61).

not assumed to be negligible, because of the nature of the data (there was not always a commission, not always a minimum wage one, etc.). Even though these instruments were thought to capture the true underlying political bargaining process, not much confidence should be placed in them.

As before, the instruments defined for bills, speeches and commissions (see Panel II of Table 5.1) are correlated to spike but not thought to be endogeneously determined with employment. If there is no reason to believe that at the time politicians are voting the bill this has an effect on employment, then neither is there reason to believe that the underlying - and prior - political bargaining process does (also see Table 5.A). Furthermore, the Sargan test - here regarded as a serial correlation test – again did not fail the specifications using such instruments (see Table 5.A). As before, this is supportive of the assumption that any correlation with past information is not too strong.

A.3 Election Data

However, regional affordability is not the only criterion for political support. As an attempt to collect data with independent variation to further test the robustness of the estimates, consider political propaganda:

> "…around 500 mayors will meet in Brasilia to discuss a strategy to pressure the Congress against … the minimum wage increase... [they] changed their strategy of pressure... mainly due to the proximity of the election campaing for the re-election of the congressmen, who dispute the support of the mayors in their electoral basis." (Estadao, 11th December, 2001).

> "Usually, the minimum wage increase is defined… in December, but this year the elections anticipated the debate… the Government strategy is to postpone the increase above inflation until after October, when the new president will have been elected." (Estadao, 10th July, 2002).

First assume that incentives for more generous increases depend on the proximity of elections. Sobel (1999, p. 766) specified a model that "shows an incentive for Congress to time changes in the minimum wage just before elections". He argues that this was the case over the entire history of the minimum wage, starting with the original Fair Labor Standards Act going into effect just eight days before election, until the most recent change (1996), just one month before the presidential election. Similarly, in Brazil, the Consolidacao das Leis do Trabalho introduced the minimum wage - on the 1st May 1943, a memorable day - as a prelude to amending the Constitution to introduce presidential elections. In every single electoral year in the sample period there was a minimum wage increase - mostly either in the same month, or a couple of months before the election. This is reassuring evidence that the minimum wage is used as political propaganda. Thus, the timing of elections was used to define an "election cycle" variable (IV78 for national, and IV79 for municipal elections).[42] The closer the elections, the higher the minimum wage. Table 5.1 confirms the expected negative correlations. The political cycle is assumed to be exogeneous, as it is determined by regular intervals of time.

Further, assume that left-wing politicians are in favour of more generous increases. The lower the minimum wage, the more dissatisfied people, and the more left-wing politicians elected. Data was collected (Nicolau, 1998, also on the internet) on the number (proportion) of

[42] Like the voting cycle, the political cycle is a linear (exponential, squared, squared root and log were also experimented) time trend between two consecutive elections (IV80 to IV87).

left-wing candidates elected as president, federal deputy, governor, estate deputy, senator, and capital mayor (IV88 to IV99). Although not included in their final version, Baker et al. (1999) used a dummy for whether left wing politicians were in power as an instrument. Similarly, data was collected on the number (proportion) of votes for left-wing candidates (IV100 to IV107). Table 5.1 shows strong negative correlations, as expected, stronger for proportions. There is no reason to believe that the number of (votes on) left wing politicians is simultaneously determined with employment. Furthermore, as argued in Section 5.4.2, any potential correlation with past information is negligible, once elections of politicians only happens every 4 years.

It follows that incentives for increases are bigger the more left wing politicians elected and the closer the elections. This translates into weighting the number and proportion of (and votes on) left-wing politicians by the election cycle (IV108 to IV127). Although weighting is expected to improve the instruments performance, Table 5.1 shows negative and strong, but not stronger, correlations. Furthermore, incentives for increases are bigger the lower the minimum wage; even if the proportion of left wing politicians is high and the next elections are close, not much political propaganda is made if the minimum wage is already at a relatively high level. Moreover, this re-introduces the real minimum wage variation into the model (Card and Krueger, 1995; Machin and Manning, 1994). Incidentally, Table 5.1 shows that this improves the correlations (IV128 to IV147).

Once more, the above instruments (see Panel III of Table 5.1) are strongly correlated with spike but not thought to be endogeneously determined with employment. Incidentally, the Sargan test did not fail the specifications using such instruments (see Table 5.A).

Some might argue that interactions "fake" the correlation with the endogenous variable and "create" a weak instrument; i.e. even if the instrument is uncorrelated with the endogenous variable in the population, correlation might not be zero in a finite sample. There is nothing intrinsic about interactions that produce nonzero correlations. In general, provided that there is some *a priori* economic reasoning - as exhaustively discussed above - in establishing the validity of the instruments, and they pass the appropriate tests (see Table 5.A), nothing particular about interactions invalidates instruments. The issue is about weak instruments, not interactions *per se*.[43] Interactions were here justified for a conceptual reason; incidentally, they produce variation in both dimensions (over time and across regions), but in general did not produce stronger correlations. Over half of the above defined instruments are "raw", i.e. free of interactions, and yet correlated with spike (see bold in Table 5.1). Interactions were motivated as further robustness checks and were by no means crucial in defining the instruments.

The above instruments were grouped to re-estimate the models from Section 5.1:

A- SPIKE (see Section 4) - plain OLS.
B- LAGS (see Section 5) - no political variables, just lagged spike as instruments.
C- RAW - interaction-free political instruments.
D- TOP30 - subsample from RAW whose correlation with spike was higher than 0.30.
E- TOP10 - subsample from RAW whose correlation with spike was higher than 0.10.
F- BILLS (IV20 to IV29) - voting data interacted with voting dummy.
G- wBILLS (IV35 to IV50) - voting data interacted with voting cycle.

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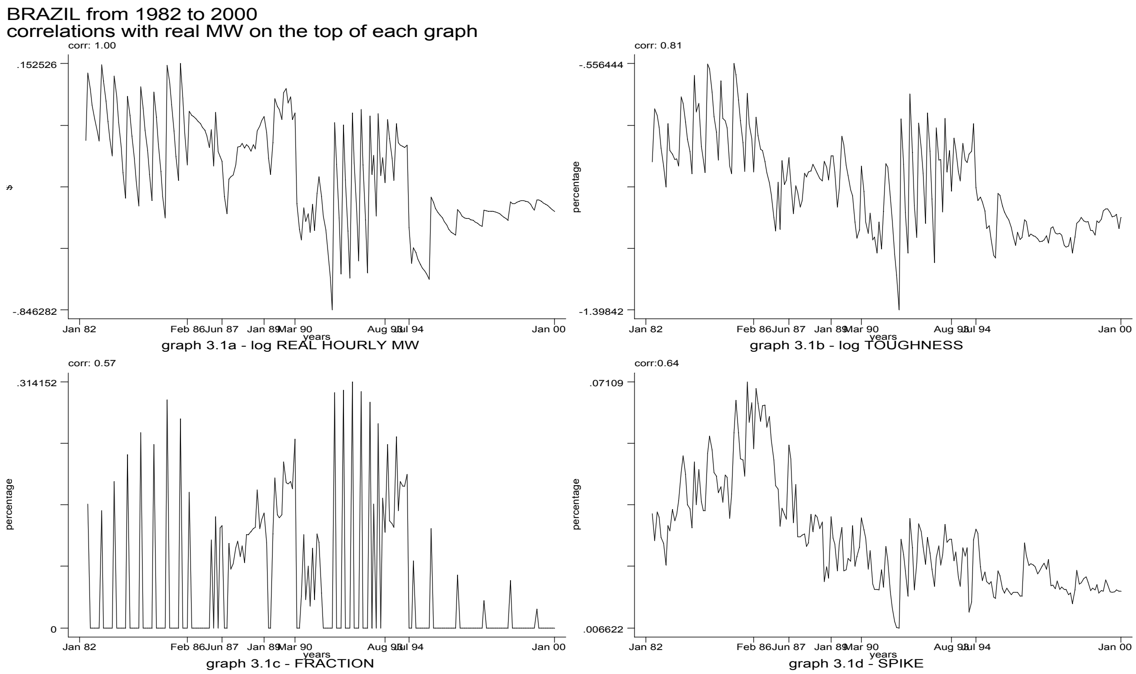
43 There is a literature on weak instruments biasing the estimates towards OLS. See original paper by Nagar (1959) and then Buse (1992), Angrist and Krueger (1995), Bound et al. (1995), Staiger and Stock (1997), Donald et al. (1997) and Krueger et al. (1999).

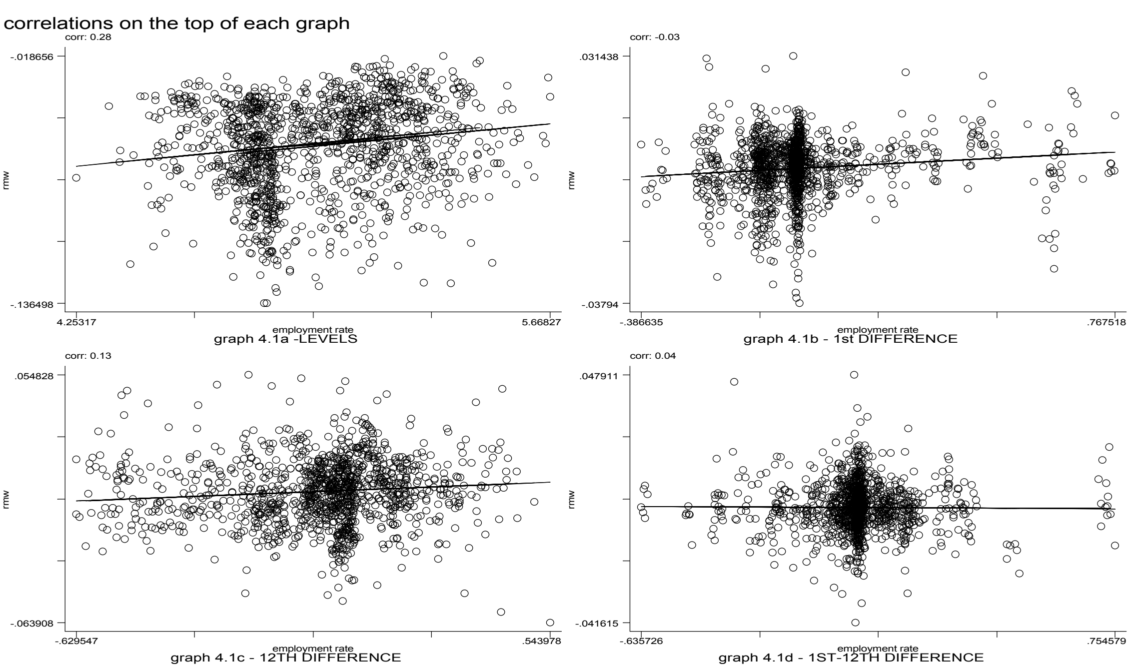
H- ELECTIONS (IV788 to IV107) - election data.

I- wELECTIONS (IV108 to IV127) - election data interacted with (linear) election cycle.

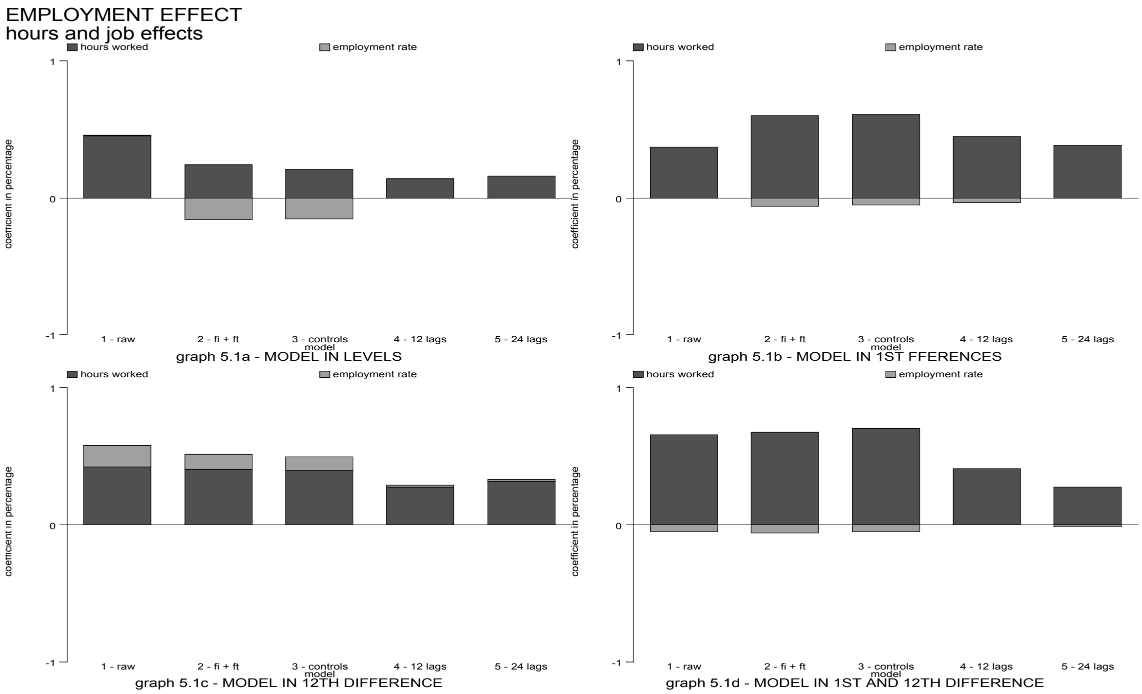
J- mwELECTIONS (IV128 to IV147) - election data interacted with (linear) election cycle and real minimum wage.



graph 3.1 - MINIMUM WAGE VARIABLES OVER TIME

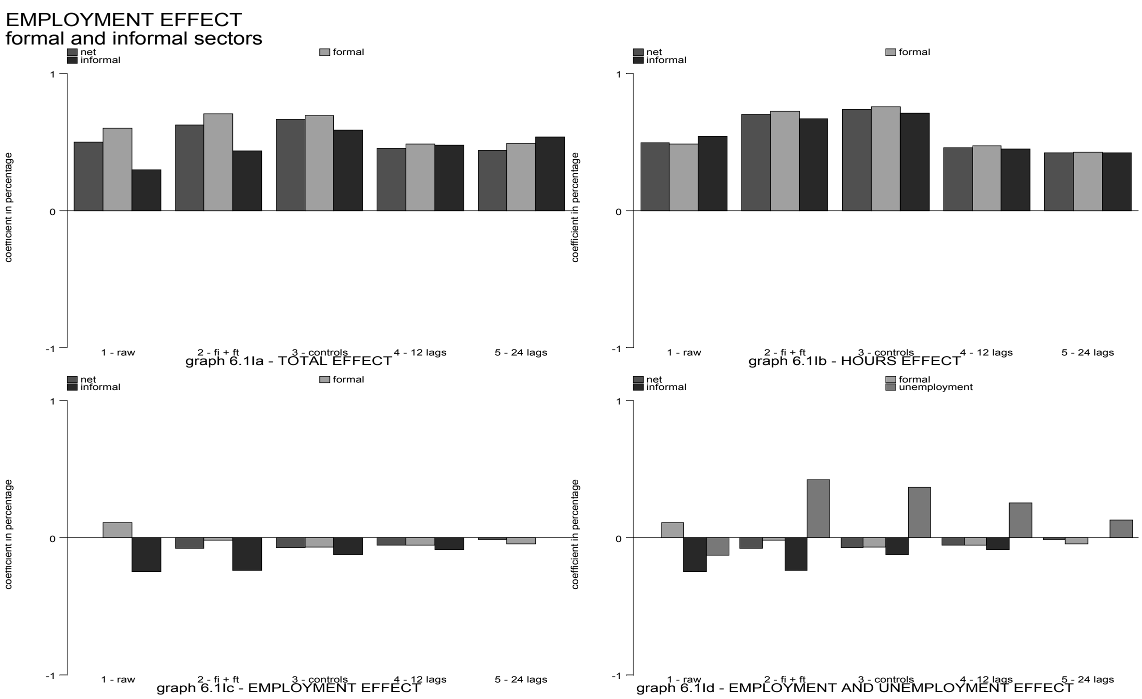


graph 4.1 - PLOT OF LOG EMPLOYMENT RATE AND LOG REAL HOURLY MW



estimates from table 5.1 panel A - OLS

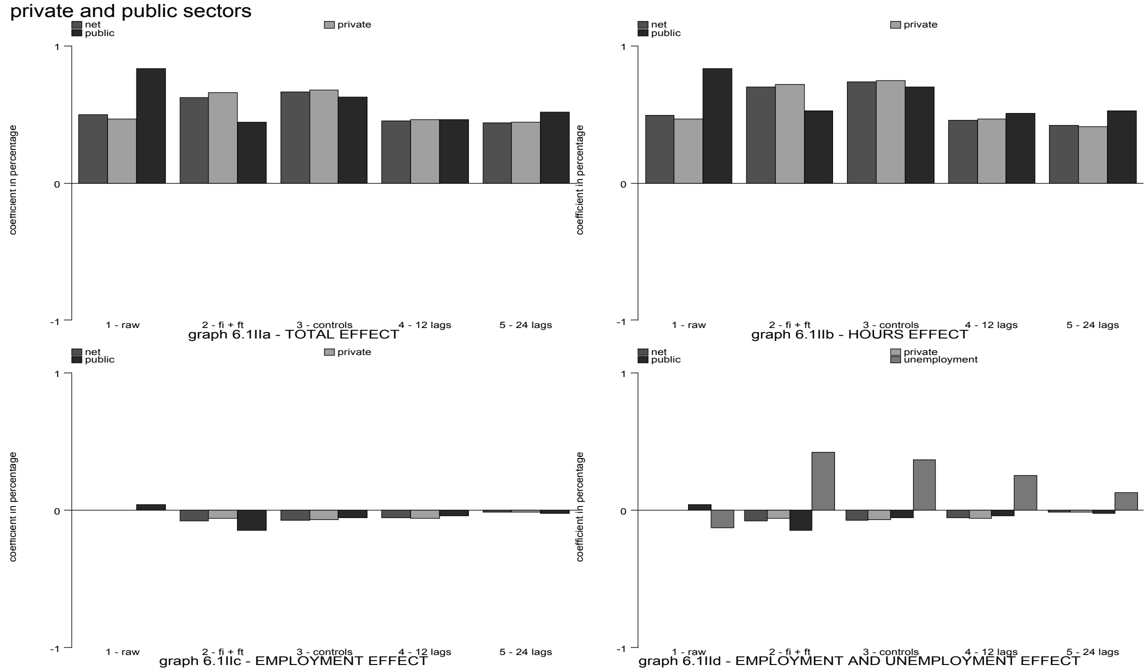
graph 4.2 - OLS ESTIMATES OF THE COEFFICIENTS OF SPIKE



estimates from table 4.A panel A and table 6.A panels 1 and 2

raph 6.1I - ESTIMATES OF THE COEFFICIENTS OF SPIKE -1st DIFFERENCE:

EMPLOYMENT EFFECT
private and public sectors



estimates from table 4.A panel A and table 6.A panels 3 and 4

raph 6.1II - ESTIMATES OF THE COEFFICIENTS OF SPIKE -1st DIFFERENCE

table 5.1 - CORRELATIONS BETWEEN THE MINIMUM WAGE SPIKE AND POLITICAL INSTRUMENTS - continues

IV	spike	real MW	iv	instrument (vary across regions and over time)	intuition
I - POLITICIANS DATA					
IV1	0.2132	0.6201	cabec	nb (out of 100) of most influential politicians in the country	the more influential the congressmen and the more pro-increase, the higher the mw
IV2	0.2819	0.1638	pcabe	IV2 as a proportion of total influential politicians in the sampled regions	as above
IV3	0.0092	0.3836	nota	measure of how worker-sympathetic congressmen are	the higher the mark, the more pro-increase, the higher the mw
IV4	-0.5585	-0.5077	esq	dummy: 1 if left wing, 0 otherwise for congressmen in IV3 (average)	the more left wing, the higher the mw
IV5	0.1616	0.0434	uni	dummy: 1 if university graduated, 0 otherwise for congressman in IV3 (average)	the more education, the bigger the support for a higher mw
IV6	-0.2488	-0.5378	man	nb of mandates for congressman in IV3 (average)	the longer in power, the less favourable of a higher mw
IV7	-0.4172	-0.3534	notape	IV3*IV4*IV5*IV6	
II - VOTING DATA					
IV8	-0.4392	-0.5852	ssim	nb of senator votes in favour of the mw increase	the more congressmen in favour of the increase (as opposed to a bigger increase), the lower the mw
IV9	-0.5559	-0.4807	csim	nb of deputy votes in favour of the mw increase	as above
IV10	-0.2007	-0.1683	snao	nb of senator votes against the mw increase	the more congressmen against the increase (as opposed to an increase), the lower the mw
IV11	-0.5022	-0.4872	cnao	nb of deputy votes against the mw increase	as above
IV12	-0.0684	-0.0495	sabs	nb of senators absent when the mw increase was voted	the more congressmen absent (the less pressure for a bigger increase), the lower the mw
IV13	-0.1311	-0.3491	cabs	nb of deputys absent when the mw increase was voted	as above
IV14	-0.5083	-0.5961	pssim	IV8 as a proportion of total senator votes	as above
IV15	-0.4220	-0.3618	pcsim	IV9 as a proportion of total deputy votes	as above
IV16	-0.2018	-0.1950	psnao	IV10 as a proportion of total senator votes	as above
IV17	-0.4685	-0.5968	pcnao	IV11 as a proportion of total deputy votes	as above
IV18	-0.4705	-0.4917	sen	dummy for senator vote: 3 non-secret, 1 secret, and 2 party oriented vote	the more non-secret votes, the lower the mw (non-secret votes expose those against it)
IV19	-0.5862	-0.5958	cam	dummy for deputy vote: 3 non-secret, 1 secret, and 2 party oriented vote	as above
IV20	-0.3811	-0.4853	sssim	IV8*IV18	
IV21	-0.5413	-0.4731	ccsim	IV9*IV19	
IV22	-0.1867	-0.1497	ssnao	IV10*IV18	
IV23	-0.4914	-0.4850	ccnao	IV11*IV19	
IV24	-0.0687	-0.0541	ssabs	IV12*IV18	
IV25	-0.1167	-0.3394	ccabs	IV13*IV19	
IV26	-0.4370	-0.4944	spssin	IV14*IV18	
IV27	-0.1964	-0.1736	spsna	IV15*IV19	
IV28	-0.4381	-0.3384	cpcsir	IV16*IV18	
IV29	-0.4644	-0.5743	cpcna	IV17*IV19	
IV30	0.3613	0.2942	cvdes	voting cycle (linear)	the more often mw bills are voted, the higher the mw
IV31	0.3665	0.2668	cvroot	voting cycle (squared root)	as above
IV32	0.0753	0.0172	cvsq	voting cycle (squared)	as above
IV33	0.3362	0.2208	cvlog	voting cycle (log)	as above
IV34	0.0810	0.0211	cvexp	voting cycle (exponential)	as above
IV35	-0.2507	-0.4181	Assim	IV8*IV30	
IV36	-0.4022	-0.4346	Acsim	IV9*IV30	
IV37	-0.1659	-0.1355	Asnac	IV10*IV30	
IV38	-0.3131	-0.3648	Acnac	IV11*IV30	
IV39	-0.3012	-0.4362	Apssir	IV14*IV30	
IV40	-0.3366	-0.4201	Apcsir	IV15*IV30	
IV41	-0.1767	-0.1656	Apsna	IV16*IV30	
IV42	-0.2767	-0.4185	Apcna	IV17*IV30	
IV43	-0.2854	-0.4486	Asssir	IV20*IV30	
IV44	-0.3969	-0.4259	Accsir	IV21*IV30	
IV45	-0.1510	-0.1120	Assna	IV22*IV30	
IV46	-0.3122	-0.3633	Accna	IV23*IV30	
IV47	-0.3364	-0.4725	Aspss	IV26*IV30	
IV48	-0.3300	-0.4004	Acpcs	IV27*IV30	
IV49	-0.1649	-0.1455	Aspsn	IV28*IV30	
IV50	-0.2758	-0.4116	Acpcn	IV29*IV30	

table 5.1 - CORRELATIONS BETWEEN THE MINIMUM WAGE SPIKE AND POLITICAL INSTRUMENTS - continues

IV	spike	real MW	iv	instrument (vary across regions and over time)	intuition
IV51	-0.3048	-0.3400	npl	nb of mw bills by congressman from the sampled regions	the more mw bills, the lower is the mw
IV52	-0.1126	-0.0481	nplesc	nb of mw bills by left wing congressman from the sampled regions	as above
IV53	-0.3061	-0.3795	nplsin	nb of mw increase bills by congressman from the sampled regions	as above
IV54	-0.0713	-0.0171	pnples	IV52 as a proportion of IV51	as above
IV55	-0.2907	-0.4357	pnplsi	IV53 as a proportion of IV51	as above
IV56	0.0592	0.1424	nplefe	dummy: 0 if bill not effective and 1 if effective (average)	the more effective the bills, the (less eroded) higher the mw
IV57	-0.0646	0.0409	npldia	nb days mw bills took to be appreciated (sum)	the longer to be appreciated, (the more pressure or the less bargaining power) the higher/lower the mw
IV58	-0.0026	0.1123	npldia	nb days mw bills took to be appreciated (average)	as above
IV59	-0.3166	-0.3862	nplum	IV51*IV56	
IV60	-0.1139	-0.0822	nplxdi	IV51*IV57	
IV61	-0.0810	-0.0004	nplxdi	IV51*IV58	
IV62	-0.1511	-0.1397	ndisc	nb of congressman speechs regarding the mw	the more the need for speechs, the lower is the mw
IV63	-0.1413	-0.1431	ndisce	nb of left wing congressman speechs regarding the mw	as above
IV64	-0.1427	-0.1497	ndiscs	nb of congressman speechs regarding a mw increase	as above
IV65	-0.1371	-0.1195	ndiscf	nb of congressman speechs favourable to a mw increase	as above
IV66	-0.1001	-0.0923	ndisca	nb of congressman speechs against a mw increase	as above
IV67	-0.1613	-0.1571	pndise	IV62 as a proportion of speechs from the sampled regions	as above
IV68	-0.1697	-0.1848	pndiss	IV63 as a proportion of speechs from the sampled regions	as above
IV69	-0.1256	-0.1347	pndisf	IV64 as a proportion of speechs from the sampled regions	as above
IV70	-0.0796	-0.0574	pndisa	IV65 as a proportion of speechs from the sampled regions	as above
IV71	-0.1949	-0.2291	comLl	nb of congressman in the mw comission	the more (the need of) congressmen in the comission, the lower the mw
IV72	-0.2481	-0.1912	comL	nb of left wing congressman in the mw comission	as above
IV73	-0.1243	-0.2184	comR	nb of right wing congressman in the mw comission	as above
IV74	-0.2013	-0.2966	comLl	IV71 as a proportion of comission congressmen	as above
IV75	0.0991	-0.1569	comLl	IV71 as a proportion of comission congressmen from the sampled regions	as above
IV76	0.0416	-0.0809	comLe	IV72 as a proportion of comission congressmen from the sampled regions	as above
IV77	0.1009	-0.1559	comR	IV73 as a proportion of comission congressmen from the sampled regions	as above
III - ELECTIONS DATA					
IV78	-0.2676	-0.3490	cn	national election cycle (linear)	the closer the elections, the lower the mw increase
IV79	-0.0328	-0.0491	cm	municipal election cycle (linear)	as above
IV80	-0.2214	-0.2992	cnroot	national election cycle (squared root)	as above
IV81	-0.0390	-0.0236	cmroc	municipal election cycle (squared root)	as above
IV82	-0.3073	-0.3903	cnsq	national election cycle (squared)	as above
IV83	-0.1994	-0.2164	cmsq	municipal election cycle (squared)	as above
IV84	-0.1510	-0.2239	cnlog	national election cycle (log)	as above
IV85	-0.0493	-0.0145	cmlog	municipal election cycle (log)	as above
IV86	-0.0335	-0.0348	cnexp	national election cycle (exponential)	as above
IV87	-0.0487	-0.0838	cmexp	municipal election cycle (exponential)	as above
IV88	-0.3801	-0.5398	npres	nb of left wing candidates to president elected	the lower the mw, the more left wing congressmen elected
IV89	-0.6359	-0.3390	ndf	nb of left wing candidates to federal deputy elected	as above
IV90	-0.3445	-0.1933	nsen	nb of left wing candidates to senator elected	as above
IV91	-0.2283	-0.2528	ngov	nb of left wing candidates to governor elected	as above
IV92	-0.4884	-0.2849	nde	nb of left wing candidates to state deputy elected	as above
IV93	-0.0215	-0.0736	npc	nb of left wing candidates to capital mayor elected	as above
IV94	-0.3801	-0.5398	pres	proportion of left wing candidates to president elected	the lower the mw, the more left wing congressmen elected
IV95	-0.6012	-0.4750	df	proportion of left wing candidates to federal deputy elected	as above
IV96	-0.4473	-0.4598	sen	proportion of left wing candidates to senator elected	as above
IV97	-0.2796	-0.2793	gov	proportion of left wing candidates to governor elected	as above
IV98	-0.5973	-0.4813	de	proportion of left wing candidates to state deputy elected	as above
IV99	-0.0215	-0.0736	pc	proportion of left wing candidates to capital mayor elected	as above

table 5.1 - CORRELATIONS BETWEEN THE MINIMUM WAGE SPIKE AND POLITICAL INSTRUMENTS - continues

IV	spike	real MW	iv	instrument (vary across regions and over time)	intuition
IV100	-0.2595	-0.2474	npres	nb of votes in left wing president candidates	as above
IV101	-0.1620	-0.1134	ndfv	nb of votes in left wing federal deputy candidates	as above
IV102	-0.2959	-0.1184	ngovv	nb of votes in left wing governor candidates	as above
IV103	-0.1458	-0.0605	ndev	nb of votes in left wing estate deputy candidates	as above
IV104	-0.5419	-0.6878	presv	proportion of votes in left wing president candidates	as above
IV105	-0.6258	-0.4876	dfv	proportion of votes in left wing federal deputy candidates	as above
IV106	-0.3882	-0.3027	govv	proportion of votes in left wing governor candidates	as above
IV107	-0.6087	-0.4948	dev	proportion of votes in left wing estate deputy candidates	as above
IV108	-0.3273	-0.4600	Enpre	IV78*IV98	
IV109	-0.4923	-0.3703	Endf	IV79*IV98	
IV110	-0.3494	-0.2339	Enser	IV80*IV98	
IV111	-0.2540	-0.2927	Engov	IV81*IV98	
IV112	-0.3868	-0.3435	Ende	IV82*IV94	
IV113	-0.0305	-0.1077	Enpc	IV83*IV99	
IV114	-0.3273	-0.4600	Epres	IV84*IV98	
IV115	-0.4563	-0.4540	Edf	IV85*IV98	
IV116	-0.3948	-0.4792	Esen	IV86*IV98	
IV117	-0.3089	-0.3129	Egov	IV87*IV98	
IV118	-0.4478	-0.4556	Ede	IV88*IV98	
IV119	-0.0305	-0.1077	Epc	IV89*IV99	
IV120	-0.2295	-0.2594	Enpre	IV90*IV98	
IV121	-0.1975	-0.0773	Endfv	IV91*IV98	
IV122	-0.3014	-0.1911	Engov	IV92*IV98	
IV123	-0.1984	-0.0921	Endev	IV93*IV98	
IV124	-0.4258	-0.5547	Epres	IV94*IV98	
IV125	-0.4544	-0.4609	Edfv	IV95*IV98	
IV126	-0.3532	-0.3355	Egovv	IV96*IV98	
IV127	-0.4414	-0.4573	Edev	IV97*IV98	
IV128	-0.3283	-0.4461	Inpres	IV108*rmw	
IV129	-0.4555	-0.2216	Indf	IV109*rmw	
IV130	-0.3236	-0.1597	Insen	IV110*rmw	
IV131	-0.2070	-0.2163	Ingov	IV111*rmw	
IV132	-0.3340	-0.1590	Inde	IV112*rmw	
IV133	-0.0326	-0.2369	Inpc	IV113*rmw	
IV134	-0.3283	-0.4461	Ipres	IV114*rmw	
IV135	-0.4178	-0.2981	Idf	IV115*rmw	
IV136	-0.3820	-0.3893	Isen	IV116*rmw	
IV137	-0.2668	-0.2428	Igov	IV117*rmw	
IV138	-0.4050	-0.2977	Ide	IV118*rmw	
IV139	-0.0326	-0.2369	Ipc	IV119*rmw	
IV140	-0.2286	-0.2395	Inpres	IV120*rmw	
IV141	-0.1661	-0.0639	Indfv	IV121*rmw	
IV142	-0.2870	-0.1288	Ingov	IV122*rmw	
IV143	-0.1644	-0.0505	Indev	IV123*rmw	
IV144	-0.4192	-0.4963	Ipresv	IV124*rmw	
IV145	-0.4135	-0.2900	Idfv	IV125*rmw	
IV146	-0.3172	-0.2368	Igovv	IV126*rmw	
IV147	-0.3982	-0.2944	Idev	IV127*rmw	

source: IV1-IV44 National Congress; IV45-IV49 DIAP

1) instruments in bold are prior to interaction

table 5.2 - EFFECT OF A 10% INCREASE IN THE MINIMUM WAGE ON EMPLOYMENT (across models and variables)

		interval		average	sd	mode (rounded)
		min	max	(across models)		(across models)
β_T	WG	**-1.00**	**1.67**	0.16	0.52	-0.33
β_H		**-0.18**	**1.13**	0.25	0.29	0.19
β_E		**-1.14**	**0.55**	-0.11	0.30	0.03
β_T	FD	**-2.50**	**2.80**	0.06	0.95	0.29
β_H		**-2.24**	**3.02**	0.29	1.00	-0.08
β_E		**-1.75**	**0.18**	-0.23	0.33	-0.17
β_T	TD	**-2.19**	**1.26**	0.34	0.53	0.07
β_H		**-0.18**	**1.70**	0.25	0.28	0.13
β_E		**-2.59**	**1.00**	0.07	0.49	0.09
β_T	FTD	**-1.71**	**4.01**	0.30	0.92	0.32
β_H		**-1.77**	**3.49**	0.35	0.90	0.06
β_E		**-0.82**	**0.67**	-0.01	0.24	-0.07

1) For full estimates see table 4.A, panels C to J, in the Appendix.

2) a 10% increase in the minimum wage increases spike by 1%

3) Dependent variable is average hours worked for the working population, average hours worked for those employed and employment rate. Endogeneous variable is spike. $\beta_T = \beta_H + \beta_E$

4) Instruments are lags of spike and political variables.

5) Hours and Job elasticities add to Total elasticity for the static but not for the dynamic models.

6) Models estimated are Within Groups (WG) and OLS on 1st (FD), 12th (TD) and 1st and 12th differences (FTD).

7) Time effects are modelled with year, seasonal-month, stabilization and 1988 structural break dummies.

8) Controls are population and instituional factors.

table 4.A - ESTIMATES OF THE IV SPIKE MODELS - continues

		(1) base		(2) fi + ft		(3) controls		(4) 12 lags		(5) 24 lags		(6) 12	(7) 24
		coef	se	coef	se	coef	se	coef	se	coef	se	long run coef	
	A - SPIKE												
β_T		**0.648**	0.072	**-0.022**	0.095	**-0.036**	0.099	**0.186**	0.082	**0.203**	0.090	**0.101**	**0.108**
β_H	**WG**	**0.591**	0.056	**0.210**	0.080	**0.193**	0.084	**0.173**	0.077	**0.200**	0.080	**0.102**	**0.109**
β_E		**0.057**	0.048	**-0.232**	0.042	**-0.230**	0.043	**-0.022**	0.023	**-0.024**	0.025	**-0.011**	**-0.013**
β_T		**0.499**	0.123	**0.625**	0.111	**0.663**	0.111	**0.452**	0.096	**0.441**	0.098	**-0.139**	**-0.117**
β_H	**FD**	**0.496**	0.126	**0.704**	0.110	**0.737**	0.109	**0.459**	0.088	**0.422**	0.090	**-0.093**	**-0.051**
β_E		**0.002**	0.039	**-0.079**	0.034	**-0.074**	0.027	**-0.054**	0.026	**-0.013**	0.030	**0.346**	**0.016**
β_T		**0.649**	0.097	**0.570**	0.102	**0.551**	0.103	**0.342**	0.097	**0.347**	0.083	**0.322**	**0.250**
β_H	**TD**	**0.447**	0.074	**0.466**	0.095	**0.454**	0.096	**0.315**	0.087	**0.328**	0.074	**0.531**	**0.326**
β_E		**0.202**	0.055	**0.104**	0.044	**0.097**	0.043	**0.002**	0.028	**-0.012**	0.031	**0.002**	**-0.008**
β_T		**0.741**	0.118	**0.747**	0.117	**0.779**	0.116	**0.447**	0.094	**0.317**	0.079	**-0.246**	**-0.084**
β_H	**FTD**	**0.809**	0.116	**0.823**	0.116	**0.844**	0.115	**0.440**	0.088	**0.317**	0.071	**-0.178**	**-0.059**
β_E		**-0.069**	0.032	**-0.076**	0.032	**-0.065**	0.030	**-0.016**	0.028	**-0.031**	0.027	**0.148**	**0.024**
	B - LAGS - lagged spike as instruments												
β_T		**0.942**	0.077	**-0.327**	0.137	**-0.327**	0.139	**-0.013**	0.123	**0.042**	0.126	**-0.007**	**0.023**
β_H	**WG**	**0.629**	0.062	**-0.023**	0.121	**-0.021**	0.122	**-0.029**	0.115	**0.060**	0.112	**-0.017**	**0.033**
β_E		**0.312**	0.047	**-0.304**	0.056	**-0.306**	0.056	**0.033**	0.034	**-0.011**	0.035	**0.017**	**-0.006**
β_T		**-0.197**	0.268	**0.675**	0.195	**0.628**	0.185	**0.556**	0.161	**0.527**	0.187	**-0.171**	**-0.140**
β_H	**FD**	**-0.158**	0.257	**0.774**	0.191	**0.738**	0.181	**0.604**	0.141	**0.513**	0.166	**-0.123**	**-0.062**
β_E		**-0.039**	0.077	**-0.099**	0.059	**-0.110**	0.047	**-0.067**	0.045	**0.012**	0.052	**0.435**	**-0.016**
β_T		**0.408**	0.129	**0.635**	0.184	**0.590**	0.181	**0.169**	0.159	**0.242**	0.132	**0.158**	**0.174**
β_H	**TD**	**0.320**	0.094	**0.414**	0.164	**0.379**	0.162	**0.126**	0.140	**0.217**	0.109	**0.213**	**0.215**
β_E		**0.087**	0.080	**0.222**	0.081	**0.211**	0.080	**0.082**	0.048	**0.052**	0.053	**0.054**	**0.034**
β_T		**0.776**	0.185	**0.907**	0.166	**0.956**	0.171	**0.374**	0.146	**0.228**	0.126	**-0.206**	**-0.059**
β_H	**FTD**	**0.877**	0.183	**0.954**	0.163	**0.975**	0.168	**0.308**	0.131	**0.192**	0.111	**-0.124**	**-0.035**
β_E		**-0.100**	0.053	**-0.047**	0.046	**-0.019**	0.043	**0.037**	0.038	**0.008**	0.043	**-0.351**	**-0.006**
	C - RAW - interaction-free political instruments												
β_T		**0.800**	0.081	**-0.370**	0.148	**-0.317**	0.148	**0.067**	0.124	**0.156**	0.136	**0.037**	**0.083**
β_H	**WG**	**0.701**	0.065	**0.068**	0.124	**0.075**	0.127	**0.074**	0.114	**0.140**	0.117	**0.043**	**0.076**
β_E		**0.098**	0.057	**-0.438**	0.070	**-0.392**	0.064	**0.000**	0.042	**0.033**	0.045	**0.000**	**0.017**
β_T		**0.156**	0.332	**0.142**	0.297	**0.198**	0.295	**-0.107**	0.246	**0.022**	0.297	**0.032**	**-0.006**
β_H	**FD**	**0.147**	0.340	**0.346**	0.287	**0.442**	0.282	**0.086**	0.223	**0.176**	0.270	**-0.017**	**-0.021**
β_E		**0.010**	0.084	**-0.204**	0.079	**-0.244**	0.070	**-0.270**	0.068	**-0.106**	0.089	**2.199**	**0.141**
β_T		**0.710**	0.168	**0.329**	0.200	**0.307**	0.200	**0.164**	0.206	**-0.161**	0.161	**0.153**	**-0.115**
β_H	**TD**	**0.334**	0.126	**0.234**	0.187	**0.219**	0.188	**0.104**	0.187	**0.070**	0.142	**0.174**	**0.070**
β_E		**0.376**	0.085	**0.094**	0.084	**0.088**	0.080	**0.037**	0.059	**-0.131**	0.061	**0.024**	**-0.086**
β_T		**1.077**	0.340	**0.666**	0.315	**0.814**	0.312	**0.456**	0.262	**-0.230**	0.244	**-0.245**	**0.056**
β_H	**FTD**	**1.151**	0.343	**0.880**	0.315	**1.037**	0.307	**0.535**	0.239	**0.040**	0.206	**-0.214**	**-0.007**
β_E		**-0.074**	0.080	**-0.214**	0.071	**-0.223**	0.070	**-0.120**	0.069	**-0.235**	0.077	**1.034**	**0.185**
	D - TOP30 - subsample from RAW whose correlation with spike was higher than 0.30												
β_T		**1.056**	0.089	**-0.255**	0.209	**-0.237**	0.206	**0.230**	0.151	**0.365**	0.165	**0.125**	**0.190**
	WG	**0.855**	0.072	**0.268**	0.162	**0.282**	0.167	**0.131**	0.143	**0.191**	0.141	**0.077**	**0.104**
β_E		**0.201**	0.061	**-0.523**	0.106	**-0.519**	0.103	**0.054**	0.057	**0.057**	0.061	**0.028**	**0.030**
β_T		**0.700**	0.582	**0.035**	0.505	**0.288**	0.493	**-0.290**	0.397	**-0.050**	0.450	**0.087**	**0.013**
	FD	**0.899**	0.581	**0.208**	0.473	**0.439**	0.469	**-0.079**	0.373	**0.167**	0.410	**0.016**	**-0.020**
β_E		**-0.199**	0.168	**-0.173**	0.162	**-0.151**	0.131	**-0.262**	0.126	**-0.101**	0.132	**2.129**	**0.132**
β_T		**0.447**	0.221	**0.766**	0.335	**0.633**	0.350	**0.505**	0.323	**0.070**	0.235	**0.475**	**0.051**
	TD	**0.328**	0.167	**0.462**	0.293	**0.296**	0.308	**0.147**	0.287	**0.229**	0.211	**0.248**	**0.227**
β_E		**0.119**	0.114	**0.304**	0.147	**0.337**	0.145	**0.182**	0.100	**-0.063**	0.089	**0.118**	**-0.042**
β_T		**0.265**	0.635	**-0.145**	0.502	**0.077**	0.500	**0.003**	0.381	**-0.211**	0.346	**-0.002**	**0.053**
	FTD	**-0.022**	0.632	**-0.338**	0.504	**-0.087**	0.505	**-0.129**	0.350	**-0.188**	0.325	**0.052**	**0.032**
β_E		**0.287**	0.201	**0.194**	0.149	**0.164**	0.145	**0.113**	0.121	**-0.071**	0.112	**-1.046**	**0.056**
	E - TOP10 - subsample from RAW whose correlation with spike was higher than 0.10												
		0.794	0.080	**-0.299**	0.160	**-0.270**	0.162	**0.141**	0.129	**0.243**	0.141	**0.076**	**0.128**
	WG	**0.703**	0.064	**0.145**	0.134	**0.157**	0.137	**0.120**	0.118	**0.195**	0.122	**0.070**	**0.106**
		0.091	0.057	**-0.444**	0.073	**-0.427**	0.072	**0.032**	0.044	**0.041**	0.047	**0.017**	**0.021**
		0.635	0.478	**0.458**	0.408	**0.728**	0.413	**0.067**	0.323	**0.294**	0.346	**-0.020**	**-0.077**
	FD	**0.889**	0.485	**0.607**	0.394	**0.902**	0.399	**0.340**	0.299	**0.475**	0.317	**-0.069**	**-0.057**
		-0.253	0.126	**-0.149**	0.117	**-0.174**	0.102	**-0.237**	0.098	**-0.061**	0.108	**1.871**	**0.079**
		0.654	0.180	**0.559**	0.238	**0.459**	0.244	**0.483**	0.239	**0.073**	0.188	**0.454**	**0.052**
	TD	**0.288**	0.137	**0.442**	0.213	**0.323**	0.217	**0.287**	0.216	**0.235**	0.168	**0.483**	**0.233**
		0.366	0.099	**0.117**	0.105	**0.136**	0.102	**0.023**	0.074	**-0.120**	0.073	**0.015**	**-0.079**
		0.965	0.404	**0.624**	0.364	**0.613**	0.358	**0.061**	0.287	**-0.195**	0.266	**-0.033**	**0.049**
	FTD	**1.062**	0.417	**0.654**	0.371	**0.706**	0.361	**0.185**	0.258	**0.035**	0.230	**-0.075**	**-0.006**
		-0.097	0.109	**-0.030**	0.089	**-0.093**	0.084	**-0.060**	0.080	**-0.165**	0.087	**0.574**	**0.130**

1) Dependent variable is average hours worked for the working population, average hours worked for those employed and employment rate.
Endogeneous variable is spike.
2) Hours and Job elasticities add to Total elasticity for the static but not for the dynamic models:
3) Colum 1 shows raw correlations, and columns 2-5 add time and region fixed effects, controls, 12 and 24 lags of dependent variable, respectively.
4) Columns 6 and 7 are long run coefficients related to the dynamic models in columns 4 and 5.

table 4.A - ESTIMATES OF THE IV SPIKE MODELS - continued

		(1) base		(2) fi + ft		(3) controls		(4) 12 lags		(5) 24 lags		(6) 12	(7) 24
		coef	se	coef	se	coef	se	coef	se	coef	se	long run coef	
	F - BILLS - voting data interacted with voting dummy												
β_T		**1.674**	0.132	**-1.000**	0.384	**-0.541**	0.360	**0.101**	0.272	**0.196**	0.292	**0.055**	**0.104**
β_H	**WG**	**1.126**	0.104	**0.142**	0.280	**0.363**	0.268	**0.189**	0.242	**0.157**	0.230	**0.110**	**0.085**
β_E		**0.548**	0.072	**-1.142**	0.197	**-0.904**	0.181	**0.007**	0.106	**0.012**	0.118	**0.004**	**0.007**
β_T		**-1.785**	1.401	**-2.498**	1.625	**-2.044**	1.843	**-0.799**	1.302	**-0.234**	1.078	**0.237**	**0.060**
β_H	**FD**	**-1.332**	1.324	**-2.071**	1.494	**-1.664**	1.708	**0.568**	1.071	**0.966**	0.925	**-0.116**	**-0.118**
β_E		**-0.453**	0.387	**-0.427**	0.380	**-0.379**	0.377	**-0.599**	0.386	**-0.644**	0.394	**8.597**	**0.908**
β_T		**-2.193**	0.592	**-0.152**	0.606	**-0.122**	0.597	**-0.069**	0.555	**-0.592**	0.409	**-0.065**	**-0.422**
β_H	**TD**	**0.398**	0.330	**0.134**	0.505	**0.169**	0.504	**0.007**	0.474	**-0.063**	0.337	**0.013**	**-0.062**
β_E		**-2.592**	0.488	**-0.286**	0.255	**-0.291**	0.242	**-0.180**	0.174	**-0.261**	0.149	**-0.117**	**-0.170**
β_T		**0.733**	1.197	**-1.710**	1.208	**-1.422**	1.155	**0.243**	0.798	**-0.111**	0.733	**-0.133**	**0.028**
β_H	**FTD**	**0.058**	1.095	**-1.774**	1.148	**-1.509**	1.115	**0.451**	0.715	**0.015**	0.653	**-0.183**	**-0.003**
β_E		**0.675**	0.413	**0.064**	0.282	**0.087**	0.271	**-0.065**	0.225	**0.016**	0.253	**0.620**	**-0.012**
	G - wBILLS - voting data interacted with voting cycle												
β_T		**0.974**	0.129	**-0.434**	0.268	**-0.029**	0.267	**0.219**	0.244	**0.424**	0.268	**0.095**	**0.185**
β_H	**WG**	**0.842**	0.104	**-0.109**	0.217	**0.192**	0.222	**0.130**	0.231	**0.380**	0.228	**0.056**	**0.158**
β_E		**0.132**	0.079	**-0.326**	0.136	**-0.220**	0.130	**0.031**	0.077	**0.039**	0.081	**0.011**	**0.014**
β_T		**2.799**	1.527	**-1.050**	0.764	**-0.745**	0.793	**0.030**	0.603	**0.105**	0.614	**-0.013**	**-0.017**
β_H	**FD**	**3.022**	1.481	**-0.337**	0.669	**-0.285**	0.714	**-0.092**	0.573	**-0.081**	0.551	**0.016**	**0.014**
β_E		**-0.222**	0.397	**-0.714**	0.275	**-0.460**	0.239	**-0.273**	0.222	**-0.193**	0.200	**0.929**	**0.146**
β_T		**1.259**	0.616	**0.402**	0.497	**0.475**	0.486	**0.816**	0.417	**-0.059**	0.295	**0.800**	**-0.030**
β_H	**TD**	**1.696**	0.507	**0.319**	0.413	**0.486**	0.408	**0.529**	0.347	**-0.003**	0.260	**0.908**	**0.089**
β_E		**-0.436**	0.331	**0.083**	0.246	**-0.011**	0.228	**-0.077**	0.132	**-0.107**	0.108	**-0.053**	**-0.067**
β_T		**1.750**	1.258	**0.594**	0.796	**0.937**	0.780	**0.792**	0.583	**-0.564**	0.507	**-0.440**	**0.166**
β_H	**FTD**	**1.979**	1.236	**1.411**	0.802	**1.628**	0.797	**0.988**	0.549	**-0.587**	0.501	**-0.435**	**0.129**
β_E		**-0.229**	0.338	**-0.817**	0.208	**-0.691**	0.198	**-0.301**	0.144	**-0.229**	0.118	**2.390**	**0.125**
	H - ELECTIONS - election data												
β_T		**0.857**	0.084	**-0.122**	0.224	**-0.144**	0.223	**0.329**	0.168	**0.524**	0.183	**0.177**	**0.270**
β_H	**WG**	**0.699**	0.067	**0.186**	0.176	**0.137**	0.180	**0.043**	0.152	**0.263**	0.162	**0.025**	**0.142**
β_E		**0.158**	0.061	**-0.307**	0.115	**-0.280**	0.111	**0.118**	0.058	**0.109**	0.062	**0.061**	**0.056**
β_T		**1.067**	2.066	**0.053**	1.224	**1.083**	0.974	**1.098**	0.773	**0.944**	0.775	**-0.343**	**-0.256**
β_H	**FD**	**1.257**	2.074	**0.054**	1.157	**1.262**	0.946	**0.881**	0.733	**1.051**	0.731	**-0.182**	**-0.129**
β_E		**-0.191**	0.673	**-0.001**	0.363	**-0.179**	0.262	**-0.248**	0.259	**-0.217**	0.275	**1.977**	**0.288**
β_T		**1.076**	0.234	**0.398**	0.327	**0.470**	0.336	**0.387**	0.368	**-0.382**	0.347	**0.364**	**-0.273**
β_H	**TD**	**0.578**	0.181	**-0.173**	0.301	**-0.088**	0.308	**-0.002**	0.337	**0.128**	0.307	**-0.003**	**0.127**
β_E		**0.498**	0.135	**0.571**	0.176	**0.558**	0.172	**0.137**	0.113	**-0.377**	0.124	**0.089**	**-0.245**
β_T		**4.012**	4.494	**0.323**	1.609	**-1.284**	2.084	**-0.315**	0.930	**-1.569**	1.364	**0.170**	**0.344**
β_H	**FTD**	**3.491**	3.983	**0.134**	1.522	**-1.391**	2.118	**-0.349**	0.869	**-0.685**	1.034	**0.141**	**0.111**
β_E		**0.521**	0.908	**0.189**	0.421	**0.107**	0.497	**0.165**	0.270	**0.153**	0.507	**-1.519**	**-0.119**
	I - wELECTIONS - election data interacted with (linear) election cycle												
β_T		**1.050**	0.139	**-0.245**	0.288	**-0.288**	0.278	**0.179**	0.243	**0.305**	0.243	**0.097**	**0.160**
	WG	**0.776**	0.106	**0.080**	0.252	**0.024**	0.246	**0.071**	0.223	**0.275**	0.207	**0.041**	**0.149**
β_E		**0.274**	0.078	**-0.325**	0.104	**-0.312**	0.095	**0.029**	0.066	**-0.021**	0.069	**0.015**	**-0.011**
β_T		**0.625**	3.098	**-0.375**	1.534	**-0.716**	1.484	**-1.435**	1.381	**-2.310**	1.840	**0.419**	**0.548**
	FD	**2.378**	3.213	**-0.558**	1.474	**-0.877**	1.425	**-1.627**	1.199	**-2.238**	1.648	**0.304**	**0.242**
β_E		**-1.753**	1.689	**0.184**	0.417	**0.161**	0.377	**-0.037**	0.332	**0.044**	0.383	**0.235**	**-0.056**
β_T		**0.127**	0.270	**0.966**	0.643	**1.019**	0.664	**1.066**	0.795	**0.249**	0.526	**1.003**	**0.179**
	TD	**0.173**	0.223	**-0.009**	0.532	**0.017**	0.544	**0.568**	0.708	**0.395**	0.488	**0.956**	**0.393**
β_E		**-0.046**	0.101	**0.976**	0.293	**1.001**	0.296	**0.226**	0.166	**-0.134**	0.161	**0.147**	**-0.088**
β_T		**0.587**	1.620	**0.423**	0.822	**1.141**	0.890	**0.068**	1.201	**-1.588**	1.504	**-0.037**	**0.348**
	FTD	**0.417**	1.552	**0.457**	0.767	**1.083**	0.845	**-0.233**	1.184	**-1.521**	1.164	**0.094**	**0.222**
β_E		**0.170**	0.429	**-0.034**	0.196	**0.058**	0.214	**0.267**	0.240	**0.337**	0.259	**-2.411**	**-0.259**
	J - mwELECTIONS - election data interacted with (linear) election cycle and real minimum wage												
		1.081	0.142	**-0.333**	0.327	**-0.423**	0.308	**0.085**	0.253	**0.161**	0.241	**0.046**	**0.085**
	WG	**0.743**	0.106	**-0.115**	0.283	**-0.181**	0.270	**-0.033**	0.235	**0.138**	0.203	**-0.019**	**0.075**
		0.338	0.079	**-0.218**	0.104	**-0.242**	0.093	**0.031**	0.061	**-0.032**	0.061	**0.016**	**-0.017**
		1.233	1.127	**0.378**	0.647	**0.441**	0.695	**-0.253**	0.646	**-0.753**	0.698	**0.076**	**0.190**
	FD	**2.530**	1.252	**0.318**	0.643	**0.428**	0.679	**0.038**	0.594	**-0.433**	0.624	**-0.008**	**0.050**
		-1.297	0.569	**0.060**	0.202	**0.013**	0.176	**-0.206**	0.150	**-0.168**	0.149	**1.567**	**0.222**
		0.023	0.278	**0.540**	0.546	**0.608**	0.545	**0.281**	0.546	**-0.335**	0.407	**0.265**	**-0.239**
	TD	**0.130**	0.234	**-0.180**	0.495	**0.011**	0.485	**0.007**	0.494	**0.005**	0.355	**0.012**	**0.005**
		-0.107	0.101	**0.720**	0.222	**0.597**	0.204	**0.117**	0.124	**-0.222**	0.116	**0.076**	**-0.145**
		0.468	1.257	**0.051**	0.658	**0.518**	0.671	**0.456**	0.746	**-0.768**	0.765	**-0.252**	**0.181**
	FTD	**0.276**	1.201	**0.059**	0.636	**0.520**	0.645	**0.657**	0.682	**-0.242**	0.599	**-0.266**	**0.041**
		0.192	0.383	**-0.008**	0.192	**-0.002**	0.178	**0.004**	0.171	**0.078**	0.177	**-0.038**	**-0.061**

5) Panel A shows OLS estimates and panels B to J show IV estimates using lags of spike and political variables as instruments. (see Section 5.2 for panel definitions).

6) Each panel has Within Groups (WG) and OLS on 1st (FD), 12th (TD) and 1st and 12th differences (FTD).

7) Time effects are modelled with year, seasonal-month, stabilization and 1988 structural break dummies.

8) Controls are population and instituional factors.

table 5.A - ESTIMATES OF THE COEFFICIENTS OF THE SPIKE - continues

(1) base

		coef	se	S	df	*H*	*se*	F	df
B- LAGS									
WG	β	**0.629**	0.062	1053.71	11	*-0.36*	*0.17*	381.52	12/1049
	β	**0.312**	0.047	512.07	11	*-0.69*	*0.13*	381.52	12/1049
FD	β	**-0.158**	0.257	46.35	11	*0.66*	*0.30*	16.97	12/1049
	β	**-0.039**	0.077	37.33	11	*0.05*	*0.09*	16.97	12/1049
TD	β	**0.320**	0.094	48.12	11	*0.14*	*0.15*	75.85	12/977
	β	**0.087**	0.080	48.65	11	*-0.31*	*0.11*	75.85	12/977
FTD	β	**0.877**	0.183	49.00	11	*-0.26*	*0.23*	31.43	12/977
	β	**-0.100**	0.053	9.34	11	*0.09*	*0.06*	31.43	12/977
C - RAW									
WG	β	**0.701**	0.065	1117.36	74	*-0.54*	*0.14*	63.08	72/1052
	β	**0.098**	0.057	973.85	74	*-0.18*	*0.13*	63.08	72/1052
FD	β	**0.147**	0.340	107.89	74	*0.44*	*0.34*	4.41	71/1052
	β	**0.010**	0.084	167.31	74	*-0.11*	*0.09*	4.41	71/1052
TD	β	**0.334**	0.126	193.83	74	*0.20*	*0.16*	10.48	72/980
	β	**0.376**	0.085	517.12	74	*-0.32*	*0.11*	10.48	72/980
FTD	β	**1.151**	0.343	73.95	74	*-0.40*	*0.36*	4.60	71/980
	β	**-0.074**	0.080	95.48	74	*0.01*	*0.09*	4.60	71/980
D - TOP30									
WG	β	**0.855**	0.072	1117.29	25	*-0.78*	*0.13*	112.57	26/1107
	β	**0.201**	0.061	878.93	25	*-0.43*	*0.11*	112.57	26/1107
FD	β	**0.899**	0.581	16.83	25	*-0.36*	*0.57*	1.80	26/1107
	β	**-0.199**	0.168	40.33	25	*0.06*	*0.17*	1.80	26/1107
TD	β	**0.328**	0.167	80.83	25	*0.15*	*0.18*	9.64	26/1035
	β	**0.119**	0.114	346.94	25	*0.11*	*0.12*	9.64	26/1035
FTD	β	**-0.022**	0.632	12.77	25	*0.84*	*0.66*	1.19	26/1035
	β	**0.287**	0.201	19.99	25	*-0.35*	*0.19*	1.19	26/1035
E - TOP10									
WG	β	**0.703**	0.064	1121.57	54	*-0.48*	*0.14*	65.06	52/1078
	β	**0.091**	0.057	948.26	54	*-0.14*	*0.13*	65.06	52/1078
FD	β	**0.889**	0.485	58.69	54	*-0.42*	*0.48*	1.71	51/1078
	β	**-0.253**	0.126	66.42	54	*0.21*	*0.12*	1.71	51/1078
TD	β	**0.288**	0.137	129.03	54	*0.23*	*0.16*	7.52	52/1006
	β	**0.366**	0.099	450.99	54	*-0.24*	*0.11*	7.52	52/1006
FTD	β	**1.062**	0.417	47.82	54	*-0.29*	*0.45*	1.64	52/1006
	β	**-0.097**	0.109	52.57	54	*0.04*	*0.12*	1.64	52/1006

(2) fi + ft

		coef	se	S	df	*H*	*se*	F	df
B- LAGS									
WG	β	**-0.023**	0.121	27.54	10	*0.27*	*0.17*	181.27	48/1013
	β	**-0.304**	0.056	15.36	10	*0.08*	*0.08*	181.27	48/1013
FD	β	**0.774**	0.191	26.91	10	*-0.24*	*0.23*	8.99	48/1013
	β	**-0.099**	0.059	16.33	10	*0.02*	*0.07*	8.99	48/1013
TD	β	**0.414**	0.164	53.04	10	*0.09*	*0.20*	30.12	46/943
	β	**0.222**	0.081	45.55	10	*-0.19*	*0.10*	30.12	46/943
FTD	β	**0.954**	0.163	43.15	10	*-0.37*	*0.20*	12.59	46/943
	β	**-0.047**	0.046	16.99	10	*0.00*	*0.06*	12.59	46/943
C - RAW									
WG	β	**0.068**	0.124	228.44	73	*0.23*	*0.15*	78.61	109/1015
	β	**-0.438**	0.070	396.26	73	*0.33*	*0.09*	78.61	109/1015
FD	β	**0.346**	0.287	71.73	73	*0.26*	*0.31*	7.01	108/1015
	β	**-0.204**	0.079	77.22	73	*0.11*	*0.09*	7.01	108/1015
TD	β	**0.234**	0.187	153.83	73	*0.30*	*0.20*	9.43	108/944
	β	**0.094**	0.084	250.11	73	*0.01*	*0.09*	9.43	108/944
FTD	β	**0.880**	0.315	147.75	73	*-0.08*	*0.33*	5.04	108/944
	β	**-0.214**	0.071	108.15	73	*0.16*	*0.08*	5.04	108/944
D - TOP30									
WG	β	**0.268**	0.162	131.28	24	*-0.07*	*0.18*	129.24	63/1070
	β	**-0.523**	0.106	284.53	24	*0.37*	*0.12*	129.24	63/1070
FD	β	**0.208**	0.473	21.24	24	*0.45*	*0.50*	3.61	63/1070
	β	**-0.173**	0.162	18.07	24	*0.12*	*0.17*	3.61	63/1070
TD	β	**0.462**	0.293	60.05	24	*0.00*	*0.30*	12.60	62/999
	β	**0.304**	0.147	130.57	24	*-0.22*	*0.15*	12.60	62/999
FTD	β	**-0.338**	0.504	27.89	24	*1.23*	*0.51*	1.08	62/999
	β	**0.194**	0.149	30.99	24	*-0.28*	*0.15*	1.08	62/999
E - TOP10									
WG	β	**0.145**	0.134	198.70	53	*0.10*	*0.16*	93.21	89/1041
	β	**-0.444**	0.073	358.29	53	*0.32*	*0.09*	93.21	89/1041
FD	β	**0.607**	0.394	34.67	53	*0.04*	*0.41*	2.93	88/1041
	β	**-0.149**	0.117	37.21	53	*0.08*	*0.12*	2.93	88/1041
TD	β	**0.442**	0.213	98.76	53	*0.03*	*0.23*	9.36	88/970
	β	**0.117**	0.105	206.15	53	*-0.01*	*0.11*	9.36	88/970
FTD	β	**0.654**	0.371	82.42	53	*0.18*	*0.39*	1.66	88/970
	β	**-0.030**	0.089	61.43	53	*-0.05*	*0.10*	1.66	88/970

(3) controls

		coef	se	S	df	*H*	*se*	F	df
B- LAGS									
WG	β	**-0.021**	0.122	31.80	10	*0.23*	*0.17*	133.96	66/995
	β	**-0.306**	0.056	13.12	10	*0.09*	*0.08*	133.96	66/995
FD	β	**0.738**	0.181	23.86	10	*-0.16*	*0.23*	7.91	66/995
	β	**-0.110**	0.047	12.86	10	*0.05*	*0.06*	7.91	66/995
TD	β	**0.379**	0.162	56.64	10	*0.12*	*0.20*	22.70	64/925
	β	**0.211**	0.080	43.57	10	*-0.18*	*0.10*	22.70	64/925
FTD	β	**0.975**	0.168	39.81	10	*0.36*	*0.20*	10.42	64/925
	β	**-0.019**	0.043	13.58	10	*-0.01*	*0.06*	10.42	64/925
C - RAW									
WG	β	**0.075**	0.127	225.91	73	*0.20*	*0.15*	74.37	127/985
	β	**-0.392**	0.064	404.31	73	*0.27*	*0.09*	74.37	127/985
FD	β	**0.442**	0.282	75.23	73	*0.34*	*0.30*	5.82	126/985
	β	**-0.244**	0.070	63.87	73	*0.20*	*0.07*	5.82	126/985
TD	β	**0.219**	0.188	145.72	73	*0.31*	*0.20*	7.82	126/920
	β	**0.088**	0.080	261.93	73	*0.01*	*0.09*	7.82	126/920
FTD	β	**1.037**	0.307	153.11	73	*-0.23*	*0.32*	4.57	125/920
	β	**-0.223**	0.070	96.75	73	*0.19*	*0.08*	4.57	125/920
D - TOP30									
WG	β	**0.282**	0.167	128.70	24	*-0.11*	*0.18*	97.95	81/1040
	β	**-0.519**	0.103	285.47	24	*0.37*	*0.11*	97.95	81/1040
FD	β	**0.439**	0.469	17.70	24	*0.31*	*0.49*	3.12	81/1040
	β	**-0.151**	0.131	13.86	24	*0.08*	*0.13*	3.12	81/1040
TD	β	**0.296**	0.308	51.18	24	*0.17*	*0.31*	9.84	80/975
	β	**0.337**	0.145	141.34	24	*-0.26*	*0.15*	9.84	80/975
FTD	β	**-0.087**	0.505	30.63	24	*0.97*	*0.52*	1.07	80/975
	β	**0.164**	0.145	31.42	24	*-0.24*	*0.14*	1.07	80/975
E - TOP10									
WG	β	**0.157**	0.137	194.23	53	*0.06*	*0.16*	79.74	107/1011
	β	**-0.427**	0.072	360.48	53	*0.30*	*0.09*	79.74	107/1011
FD	β	**0.902**	0.399	32.50	53	*-0.18*	*0.41*	2.63	106/1011
	β	**-0.174**	0.102	39.13	53	*0.11*	*0.10*	2.63	106/1011
TD	β	**0.323**	0.217	91.51	53	*0.15*	*0.23*	7.71	106/946
	β	**0.136**	0.102	227.55	53	*-0.05*	*0.11*	7.71	106/946
FTD	β	**0.706**	0.361	95.85	53	*0.15*	*0.38*	1.66	106/946
	β	**-0.093**	0.084	67.20	53	*0.03*	*0.09*	1.66	106/946

(4) 12 lags

		coef	se	S	df	*H*	*se*	F	df
B- LAGS									
WG	β	**-0.029**	0.115	37.56	10	*0.41*	*0.16*	123.81	78/983
	β	**0.033**	0.034	19.19	10	*-0.10*	*0.05*	121.26	78/983
FD	β	**0.604**	0.141	22.87	10	*-0.22*	*0.17*	7.01	78/977
	β	**-0.067**	0.045	14.81	10	*0.02*	*0.06*	6.51	78/977
TD	β	**0.126**	0.140	34.94	10	*0.30*	*0.18*	22.15	76/913
	β	**0.082**	0.048	26.49	10	*-0.13*	*0.06*	20.06	76/913
FTD	β	**0.308**	0.131	33.22	10	*0.22*	*0.17*	9.32	76/907
	β	**0.037**	0.038	19.95	10	*-0.09*	*0.05*	9.36	76/907
C - RAW									
WG	β	**0.074**	0.114	138.81	73	*0.17*	*0.14*	73.02	138/914
	β	**0.000**	0.042	131.18	73	*-0.04*	*0.05*	120.52	138/914
FD	β	**0.086**	0.223	114.34	73	*0.43*	*0.23*	3.45	137/908
	β	**-0.270**	0.068	111.86	73	*0.25*	*0.07*	3.79	137/908
TD	β	**0.104**	0.187	169.67	73	*0.27*	*0.19*	7.67	136/844
	β	**0.037**	0.059	139.56	73	*-0.04*	*0.07*	7.57	136/844
FTD	β	**0.535**	0.239	157.76	73	*-0.11*	*0.25*	3.26	136/838
	β	**-0.120**	0.069	134.13	73	*0.12*	*0.07*	2.91	136/838
D - TOP30									
WG	β	**0.131**	0.143	56.01	24	*0.06*	*0.16*	86.12	92/969
	β	**0.054**	0.057	39.49	24	*-0.10*	*0.06*	88.19	92/969
FD	β	**-0.079**	0.373	36.09	24	*0.57*	*0.39*	2.79	92/963
	β	**-0.262**	0.126	35.74	24	*0.22*	*0.12*	2.40	92/963
TD	β	**0.147**	0.287	63.78	24	*0.19*	*0.29*	8.86	90/899
	β	**0.182**	0.100	55.90	24	*-0.20*	*0.10*	8.33	90/899
FTD	β	**-0.129**	0.350	27.89	24	*0.60*	*0.35*	2.42	90/893
	β	**0.113**	0.121	35.43	24	*-0.14*	*0.12*	1.18	90/893
E - TOP10									
WG	β	**0.120**	0.118	101.58	53	*0.09*	*0.14*	88.39	118/940
	β	**0.032**	0.044	86.65	53	*-0.08*	*0.05*	118.13	118/940
FD	β	**0.340**	0.299	74.85	53	*0.13*	*0.32*	2.46	117/934
	β	**-0.237**	0.098	78.66	53	*0.20*	*0.10*	2.14	117/934
TD	β	**0.287**	0.216	106.00	53	*0.03*	*0.22*	7.45	116/870
	β	**0.023**	0.074	100.50	53	*-0.02*	*0.08*	7.23	116/870
FTD	β	**0.185**	0.258	63.48	53	*0.28*	*0.27*	2.57	116/864
	β	**-0.060**	0.080	78.72	53	*0.05*	*0.08*	1.66	116/864

(5) 24 lags

		coef	se	S	df	*H*	*se*	F	df
B- LAGS									
WG	β	**0.060**	0.112	36.22	10	*0.30*	*0.16*	89.46	88/901
	β	**-0.011**	0.035	13.40	10	*-0.02*	*0.05*	83.71	88/901
FD	β	**0.513**	0.166	24.80	10	*-0.13*	*0.20*	6.35	88/895
	β	**0.012**	0.052	14.50	10	*0.03*	*0.03*	33.21	88/895
TD	β	**0.217**	0.109	31.23	10	*0.17*	*0.14*	17.01	87/830
	β	**0.052**	0.053	18.28	10	*-0.10*	*0.06*	16.64	87/830
FTD	β	**0.192**	0.111	29.16	10	*0.20*	*0.15*	8.79	86/825
	β	**0.008**	0.043	23.73	10	*-0.07*	*0.06*	8.46	86/825
C - RAW									
WG	β	**0.140**	0.117	151.63	73	*0.11*	*0.14*	41.47	148/832
	β	**0.033**	0.045	121.34	73	*-0.09*	*0.06*	42.79	148/832
FD	β	**0.176**	0.270	136.43	73	*0.28*	*0.29*	2.78	147/826
	β	**-0.106**	0.089	105.62	73	*-0.01*	*0.03*	44.39	148/826
TD	β	**0.070**	0.142	141.01	73	*0.34*	*0.15*	9.54	146/761
	β	**-0.131**	0.061	150.36	73	*0.16*	*0.07*	7.51	147/761
FTD	β	**0.040**	0.206	133.76	73	*0.31*	*0.22*	3.23	146/756
	β	**-0.235**	0.077	124.11	73	*0.23*	*0.08*	3.24	146/756
D - TOP30									
WG	β	**0.191**	0.141	59.67	24	*0.01*	*0.15*	61.72	102/887
	β	**0.057**	0.061	35.96	24	*-0.10*	*0.07*	59.07	102/887
FD	β	**0.167**	0.410	35.68	24	*0.27*	*0.43*	2.68	102/881
	β	**-0.101**	0.132	33.42	24	*0.00*	*0.03*	54.52	102/881
TD	β	**0.229**	0.211	68.00	24	*0.11*	*0.22*	7.31	101/816
	β	**-0.063**	0.089	55.76	24	*0.06*	*0.09*	6.95	101/816
FTD	β	**-0.188**	0.325	35.37	24	*0.53*	*0.33*	2.89	100/811
	β	**-0.071**	0.112	33.62	24	*0.04*	*0.11*	1.36	100/811
E - TOP10									
WG	β	**0.195**	0.122	105.97	53	*0.01*	*0.14*	44.02	128/858
	β	**0.041**	0.047	79.14	53	*-0.09*	*0.06*	46.57	128/858
FD	β	**0.475**	0.317	78.72	53	*-0.06*	*0.34*	2.50	127/852
	β	**-0.061**	0.108	70.57	53	*-0.01*	*0.03*	47.77	128/852
TD	β	**0.235**	0.168	104.34	53	*0.11*	*0.18*	7.10	127/787
	β	**-0.120**	0.073	106.14	53	*0.13*	*0.08*	6.45	127/787
FTD	β	**0.035**	0.230	72.20	53	*0.31*	*0.24*	2.78	126/782
	β	**-0.165**	0.087	78.87	53	*0.15*	*0.09*	1.79	126/782

1) Dependent variable is average hours worked for the working population, average hours worked for those employed and employment rate. Endogeneous variable is spike.

2) Colum 1 shows coefficients for raw correlations, and associated standard errors, Sargan test, Hausman test and F test (step of the 2SLS).
Columns 2-5 add time and region fixed effects, controls, 12 and 24 lags of dependent variable, respectively.

3) Degree of freedom for Sargan and F test are indicated. Standard errors for Hausman test are indicated.

5) Panels B to J show IV estimates using lags of spike and political variables as instruments.
(see Section 5.2 for panel definitions).

5) Each panel has Within Groups (WG) and OLS on 1st (FD), 12th (TD) and 1st and 12th differences (FTD).

6) Time effects are modelled with year, seasonal-month, stabilization and 1988 structural break dummies.

7) Controls are populational and instituional factors.

table 5.A - ESTIMATES OF THE COEFFICIENTS OF THE SPIKE - continued

(1) base

	coef	se	S	df	*H*	*se*	F	df
F - BILLS								
WG	**1.126**	0.104	1120.72	11	*-0.95*	*0.13*	125.02	12/1121
	0.548	0.072	638.39	11	*-0.87*	*0.08*	125.02	12/1121
FD	**-1.332**	1.324	3.21	11	*2.00*	*1.29*	5.38	12/1121
	-0.453	0.387	9.05	11	*0.24*	*0.39*	5.38	12/1121
TD	**0.398**	0.330	28.00	11	*0.05*	*0.33*	25.36	12/1049
	-2.592	0.488	31.88	11	*2.90*	*0.24*	25.36	12/1049
FTD	**0.058**	1.095	1.68	11	*0.79*	*1.09*	19.71	12/1049
	0.675	0.413	2.29	11	*-0.76*	*0.34*	19.71	12/1049
G - wBILLS								
WG	**0.842**	0.104	1128.71	15	*-0.34*	*0.12*	34.06	16/1117
	0.132	0.079	613.54	15	*-0.10*	*0.09*	34.06	16/1117
FD	**3.022**	1.481	5.17	15	*-2.27*	*1.20*	0.92	16/1117
	-0.222	0.397	4.69	15	*0.17*	*0.38*	0.92	16/1117
TD	**1.696**	0.507	33.66	15	*-1.27*	*0.44*	2.30	16/1045
	-0.436	0.331	86.10	15	*0.65*	*0.32*	2.30	16/1045
FTD	**1.979**	1.236	4.16	15	*-1.16*	*1.16*	0.58	16/1045
	-0.229	0.338	8.02	15	*0.16*	*0.34*	0.58	16/1045
H - ELECTIONS								
WG	**0.699**	0.067	1110.87	17	*-0.36*	*0.12*	150.25	15/1115
	0.158	0.061	846.62	17	*-0.34*	*0.12*	150.25	15/1115
FD	**1.257**	2.074	4.55	17	*-0.63*	*1.92*	0.26	14/1115
	-0.191	0.673	15.50	17	*-0.67*	*0.61*	0.26	14/1115
TD	**0.578**	0.181	37.86	17	*-0.16*	*0.19*	12.17	15/1043
	0.498	0.135	262.93	17	*-0.35*	*0.14*	12.17	15/1043
FTD	**3.491**	3.983	3.08	17	*-2.59*	*2.91*	0.09	15/1043
	0.521	0.908	3.77	17	*-0.54*	*0.69*	0.09	15/1043
I - wELECTIONS								
WG	**0.776**	0.106	1130.65	17	*-0.29*	*0.13*	43.10	14/1115
	0.274	0.078	779.38	17	*-0.34*	*0.10*	43.10	14/1115
FD	**2.378**	3.213	6.47	17	*-0.09*	*3.06*	0.11	14/1115
	-1.753	1.689	14.85	17	*0.06*	*0.91*	0.11	14/1115
TD	**0.173**	0.223	61.36	17	*0.33*	*0.23*	7.77	14/1043
	-0.046	0.101	105.21	17	*0.30*	*0.12*	7.77	14/1043
FTD	**0.417**	1.552	3.02	17	*0.41*	*1.56*	0.28	14/1043
	0.170	0.429	3.63	17	*-0.23*	*0.42*	0.28	14/1043
J - mwELECTIONS								
WG	**0.743**	0.106	1132.26	17	*-0.23*	*0.13*	41.01	14/1115
	0.338	0.079	778.25	17	*-0.43*	*0.10*	41.01	14/1115
FD	**2.530**	1.252	5.14	17	*-2.18*	*1.18*	0.66	14/1115
	-1.297	0.569	10.76	17	*1.26*	*0.40*	0.66	14/1115
TD	**0.130**	0.234	57.07	17	*0.39*	*0.24*	7.14	14/1043
	-0.107	0.101	99.69	17	*0.38*	*0.11*	7.14	14/1043
FTD	**0.276**	1.201	2.78	17	*0.54*	*1.21*	0.40	14/1043
	0.192	0.383	3.88	17	*-0.25*	*0.37*	0.40	14/1043

(2) fi + ft

	coef	se	S	df	*H*	*se*	F	df
F - BILLS								
WG	**0.142**	0.280	35.57	10	*0.07*	*0.29*	103.19	49/1084
	-1.142	0.197	86.83	10	*0.96*	*0.22*	103.19	49/1084
FD	**-2.071**	1.494	2.28	10	*2.68*	*1.20*	7.00	49/1084
	-0.427	0.380	6.38	10	*0.36*	*0.36*	7.00	49/1084
TD	**0.134**	0.505	12.79	10	*0.34*	*0.50*	21.89	48/1013
	-0.286	0.255	43.48	10	*0.40*	*0.25*	21.89	48/1013
FTD	**-1.774**	1.148	4.34	10	*2.62*	*0.95*	3.49	48/1013
	0.064	0.282	7.11	10	*-0.14*	*0.28*	3.49	48/1013
G - wBILLS								
WG	**-0.109**	0.217	55.83	14	*0.35*	*0.22*	103.91	53/1080
	-0.326	0.136	95.68	14	*0.10*	*0.15*	103.91	53/1080
FD	**-0.337**	0.669	6.42	14	*1.06*	*0.66*	3.80	53/1080
	-0.714	0.275	5.28	14	*0.66*	*0.23*	3.80	53/1080
TD	**0.319**	0.413	71.33	14	*0.15*	*0.42*	14.35	52/1009
	0.083	0.246	62.66	14	*0.02*	*0.25*	14.35	52/1009
FTD	**1.411**	0.802	39.19	14	*-0.60*	*0.81*	1.30	52/1009
	-0.817	0.208	7.39	14	*0.76*	*0.17*	1.30	52/1009
H - ELECTIONS								
WG	**0.186**	0.176	105.83	16	*0.03*	*0.18*	110.56	52/1078
	-0.307	0.115	214.65	16	*0.09*	*0.13*	110.56	52/1078
FD	**0.054**	1.157	9.64	16	*0.69*	*1.11*	3.57	51/1078
	-0.001	0.363	4.97	16	*-0.10*	*0.35*	3.57	51/1078
TD	**-0.173**	0.301	23.94	16	*0.69*	*0.30*	13.36	51/1007
	0.571	0.176	68.58	16	*-0.50*	*0.17*	13.36	51/1007
FTD	**0.134**	1.522	15.22	16	*0.72*	*1.55*	0.39	51/1007
	0.189	0.421	9.35	16	*-0.25*	*0.41*	0.39	51/1007
I - wELECTIONS								
WG	**0.080**	0.252	100.83	16	*0.15*	*0.28*	96.95	51/1078
	-0.325	0.104	174.23	16	*0.11*	*0.11*	96.95	51/1078
FD	**-0.558**	1.474	6.62	16	*1.02*	*1.44*	3.62	51/1078
	0.184	0.417	3.31	16	*-0.30*	*0.41*	3.62	51/1078
TD	**-0.009**	0.532	37.89	16	*0.49*	*0.55*	11.18	50/1007
	0.976	0.293	65.41	16	*-0.90*	*0.24*	11.18	50/1007
FTD	**0.457**	0.767	7.01	16	*0.35*	*0.77*	0.84	50/1007
	-0.034	0.196	14.11	16	*-0.05*	*0.20*	0.84	50/1007
J - mwELECTIONS								
WG	**-0.115**	0.283	102.93	16	*0.38*	*0.31*	93.50	51/1078
	-0.218	0.104	161.39	16	*-0.02*	*0.12*	93.50	51/1078
FD	**0.318**	0.643	9.35	16	*0.33*	*0.66*	4.02	51/1078
	0.060	0.202	3.59	16	*-0.15*	*0.19*	4.02	51/1078
TD	**-0.180**	0.495	31.01	16	*0.68*	*0.48*	12.42	50/1007
	0.720	0.222	75.03	16	*-0.65*	*0.21*	12.42	50/1007
FTD	**0.059**	0.636	10.06	16	*0.76*	*0.63*	0.85	50/1007
	-0.008	0.192	14.12	16	*-0.07*	*0.19*	0.85	50/1007

(3) controls

	coef	se	S	df	*H*	*se*	F	df
F - BILLS								
WG	**0.363**	0.268	33.09	10	*-0.18*	*0.28*	70.13	67/1054
	-0.904	0.181	103.79	10	*0.72*	*0.20*	70.13	67/1054
FD	**-1.664**	1.708	2.30	10	*2.41*	*1.42*	4.63	67/1054
	-0.379	0.377	4.50	10	*0.31*	*0.36*	4.63	67/1054
TD	**0.169**	0.504	14.34	10	*0.29*	*0.50*	11.56	66/989
	-0.291	0.242	46.03	10	*0.40*	*0.24*	11.56	66/989
FTD	**-1.509**	1.115	4.07	10	*2.37*	*0.95*	6.07	66/989
	0.087	0.271	5.39	10	*-0.15*	*0.27*	6.07	66/989
G - wBILLS								
WG	**0.192**	0.222	54.97	14	*0.00*	*0.23*	74.54	71/1050
	-0.220	0.130	93.27	14	*-0.01*	*0.14*	74.54	71/1050
FD	**-0.285**	0.714	5.85	14	*1.04*	*0.70*	3.16	71/1050
	-0.460	0.239	5.37	14	*0.39*	*0.21*	3.16	71/1050
TD	**0.486**	0.408	74.89	14	*-0.03*	*0.41*	11.09	70/985
	-0.011	0.228	70.37	14	*0.11*	*0.23*	11.09	70/985
FTD	**1.628**	0.797	39.43	14	*0.81*	*0.80*	1.22	70/985
	-0.691	0.198	7.84	14	*0.65*	*0.17*	1.22	70/985
H - ELECTIONS								
WG	**0.137**	0.180	108.64	16	*0.07*	*0.19*	80.57	70/1048
	-0.280	0.111	223.13	16	*0.06*	*0.12*	80.57	70/1048
FD	**1.262**	0.946	7.79	16	*-0.53*	*0.93*	2.98	69/1048
	-0.179	0.262	6.89	16	*0.11*	*0.26*	2.98	69/1048
TD	**-0.088**	0.308	26.46	16	*0.58*	*0.31*	10.03	69/983
	0.558	0.172	72.87	16	*-0.50*	*0.17*	10.03	69/983
FTD	**-1.391**	2.118	12.23	16	*2.24*	*1.57*	0.53	69/983
	0.107	0.497	14.20	16	*-0.17*	*0.47*	0.53	69/983
I - wELECTIONS								
WG	**0.024**	0.246	101.48	16	*0.20*	*0.27*	70.68	69/1048
	-0.312	0.095	179.66	16	*0.10*	*0.11*	70.68	69/1048
FD	**-0.877**	1.425	7.32	16	*1.63*	*1.31*	2.95	69/1048
	0.161	0.377	6.26	16	*-0.24*	*0.38*	2.95	69/1048
TD	**0.017**	0.544	37.25	16	*0.45*	*0.55*	8.39	68/983
	1.001	0.296	59.27	16	*-0.94*	*0.23*	8.39	68/983
FTD	**1.083**	0.845	8.14	16	*0.24*	*0.85*	0.86	68/983
	0.058	0.214	13.08	16	*-0.12*	*0.22*	0.86	68/983
J - mwELECTIONS								
WG	**-0.181**	0.270	102.91	16	*0.45*	*0.30*	69.20	69/1048
	-0.242	0.093	165.38	16	*0.01*	*0.11*	69.20	69/1048
FD	**0.428**	0.679	10.65	16	*0.32*	*0.68*	3.19	69/1048
	0.013	0.176	7.44	16	*-0.09*	*0.17*	3.19	69/1048
TD	**0.011**	0.485	30.15	16	*0.47*	*0.47*	9.43	68/983
	0.597	0.204	82.98	16	*-0.53*	*0.20*	9.43	68/983
FTD	**0.520**	0.645	10.66	16	*0.33*	*0.66*	0.91	68/983
	-0.002	0.178	12.69	16	*-0.06*	*0.18*	0.91	68/983

(4) 12 lags

	coef	se	S	df	*H*	*se*	F	df
F - BILLS								
WG	**0.189**	0.242	11.86	10	*-0.02*	*0.25*	59.56	78/983
	0.007	0.106	14.86	10	*-0.03*	*0.11*	61.53	78/983
FD	**0.568**	1.071	11.97	10	*-0.11*	*1.08*	3.29	78/977
	-0.599	0.386	5.32	10	*0.55*	*0.35*	3.16	78/977
TD	**0.007**	0.474	14.08	10	*0.32*	*0.48*	9.77	76/913
	-0.180	0.174	13.63	10	*0.19*	*0.17*	9.60	76/913
FTD	**0.451**	0.715	10.53	10	*-0.01*	*0.72*	7.91	76/907
	-0.065	0.225	12.11	10	*0.05*	*0.23*	3.28	76/907
G - wBILLS								
WG	**0.130**	0.231	39.13	14	*0.05*	*0.24*	62.13	82/979
	0.031	0.077	23.51	14	*-0.06*	*0.08*	67.13	82/979
FD	**-0.092**	0.573	32.95	14	*0.56*	*0.58*	2.80	82/973
	-0.273	0.222	19.41	14	*0.22*	*0.21*	2.28	82/973
TD	**0.529**	0.347	46.65	14	*-0.22*	*0.35*	9.04	80/909
	-0.077	0.132	38.02	14	*0.08*	*0.13*	9.37	80/909
FTD	**0.988**	0.549	43.22	14	*-0.56*	*0.54*	2.49	80/903
	-0.301	0.144	15.86	14	*0.30*	*0.14*	1.41	80/903
H - ELECTIONS								
WG	**0.043**	0.152	41.86	16	*0.16*	*0.16*	70.52	81/977
	0.118	0.058	23.83	16	*-0.17*	*0.06*	95.41	81/977
FD	**0.881**	0.733	20.21	16	*-0.43*	*0.73*	2.59	80/971
	-0.248	0.259	29.30	16	*0.20*	*0.25*	2.16	80/971
TD	**-0.002**	0.337	45.44	16	*0.34*	*0.34*	8.48	79/907
	0.137	0.113	41.32	16	*-0.14*	*0.12*	8.33	79/907
FTD	**-0.349**	0.869	10.97	16	*0.80*	*0.80*	2.03	79/901
	0.165	0.270	23.40	16	*-0.18*	*0.27*	0.72	79/901
I - wELECTIONS								
WG	**0.071**	0.223	46.71	16	*0.13*	*0.24*	59.01	80/977
	0.029	0.066	21.90	16	*-0.06*	*0.07*	64.52	80/977
FD	**-1.627**	1.199	17.80	16	*2.11*	*0.99*	2.59	80/971
	-0.037	0.332	19.27	16	*-0.02*	*0.33*	2.18	80/971
TD	**0.568**	0.708	45.70	16	*-0.26*	*0.69*	5.97	78/907
	0.226	0.166	36.73	16	*-0.23*	*0.16*	5.99	78/907
FTD	**-0.233**	1.184	10.92	16	*0.68*	*1.12*	2.10	78/901
	0.267	0.240	19.80	16	*-0.29*	*0.24*	0.91	78/901
J - mwELECTIONS								
WG	**-0.033**	0.235	41.98	16	*0.26*	*0.26*	58.02	80/977
	0.031	0.061	24.18	16	*-0.06*	*0.07*	63.90	80/977
FD	**0.038**	0.594	21.48	16	*0.44*	*0.58*	2.87	80/971
	-0.206	0.150	22.73	16	*0.16*	*0.15*	2.45	80/971
TD	**0.007**	0.494	43.88	16	*0.32*	*0.49*	6.27	78/907
	0.117	0.124	41.05	16	*-0.12*	*0.13*	6.23	78/907
FTD	**0.657**	0.682	17.85	16	*-0.22*	*0.69*	2.23	78/901
	0.004	0.171	20.60	16	*-0.02*	*0.17*	1.02	78/901

(5) 24 lags

	coef	se	S	df	*H*	*se*	F	df
F - BILLS								
WG	**0.157**	0.230	12.96	10	*0.05*	*0.25*	39.79	88/901
	0.012	0.118	15.94	10	*-0.04*	*0.12*	41.80	88/901
FD	**0.966**	0.925	7.84	10	*-0.55*	*0.92*	3.08	88/895
	-0.644	0.394	4.30	10	*0.02*	*0.03*	38.09	88/895
TD	**-0.063**	0.337	15.27	10	*0.41*	*0.33*	16.93	87/830
	-0.261	0.149	17.52	10	*0.26*	*0.15*	12.47	87/830
FTD	**0.015**	0.653	22.29	10	*0.31*	*0.66*	6.09	86/825
	0.016	0.253	18.44	10	*-0.05*	*0.25*	2.66	86/825
G - wBILLS								
WG	**0.380**	0.228	36.40	14	*-0.20*	*0.23*	40.59	92/897
	0.039	0.081	19.46	14	*-0.07*	*0.08*	42.64	92/897
FD	**-0.081**	0.551	31.42	14	*0.52*	*0.55*	2.61	92/891
	-0.193	0.200	19.82	14	*0.02*	*0.03*	35.40	92/891
TD	**-0.003**	0.260	42.52	14	*0.36*	*0.26*	7.21	91/826
	-0.107	0.108	48.42	14	*0.10*	*0.11*	7.33	91/826
FTD	**-0.587**	0.501	27.28	14	*0.93*	*0.47*	3.03	90/821
	-0.229	0.118	25.43	14	*0.21*	*0.12*	1.72	90/821
H - ELECTIONS								
WG	**0.263**	0.162	44.52	16	*-0.08*	*0.16*	50.22	91/895
	0.109	0.062	26.54	16	*-0.16*	*0.07*	54.98	91/895
FD	**1.051**	0.731	22.52	16	*-0.64*	*0.71*	2.42	90/889
	-0.217	0.275	22.42	16	*0.00*	*0.03*	51.65	91/889
TD	**0.128**	0.307	55.44	16	*0.21*	*0.31*	7.03	90/824
	-0.377	0.124	41.62	16	*0.39*	*0.12*	6.68	90/824
FTD	**-0.685**	1.034	22.83	16	*1.01*	*0.93*	2.62	89/819
	0.153	0.507	24.74	16	*-0.18*	*0.49*	0.90	89/819
I - wELECTIONS								
WG	**0.275**	0.207	49.86	16	*-0.09*	*0.23*	39.31	90/895
	-0.021	0.069	24.63	16	*0.00*	*0.08*	39.84	90/895
FD	**-2.238**	1.648	25.06	16	*2.68*	*1.26*	2.32	90/889
	0.044	0.383	17.07	16	*0.03*	*0.03*	32.88	90/889
TD	**0.395**	0.488	69.34	16	*-0.07*	*0.49*	5.24	89/824
	-0.134	0.161	47.95	16	*0.13*	*0.16*	5.25	89/824
FTD	**-1.521**	1.164	17.37	16	*1.85*	*0.87*	2.74	88/819
	0.337	0.259	9.33	16	*-0.37*	*0.26*	1.18	88/819
J - mwELECTIONS								
WG	**0.138**	0.203	44.67	16	*0.08*	*0.23*	39.55	90/895
	-0.032	0.061	30.61	16	*0.01*	*0.07*	40.78	90/895
FD	**-0.433**	0.624	24.27	16	*0.89*	*0.58*	2.61	90/889
	-0.168	0.149	22.91	16	*0.03*	*0.03*	34.11	90/889
TD	**0.005**	0.355	40.57	16	*0.34*	*0.35*	6.04	89/824
	-0.222	0.116	50.51	16	*0.22*	*0.11*	5.88	89/824
FTD	**-0.242**	0.599	13.94	16	*0.57*	*0.55*	2.89	88/819
	0.078	0.177	14.79	16	*-0.11*	*0.18*	1.33	88/819

table 6.A - ESTIMATES OF THE SPIKE COEFFICIENTS - FORMAL AND INFORMAL, PRIVATE AND PUBLIC SECTORS

		(1) base			(2) fi + ft			(3) controls			(4) 12 lags			(5) 24 lags		
		coef	se	test	coef	se	test	coef	se	test	coef	se	test	coef	se	test
	1 - FORMAL															
β_T		**0.599**	0.125	0.225	**0.706**	0.123	0.200	**0.691**	0.117	0.173	**0.485**	0.109	0.156	**0.489**	0.108	0.172
β_H	**FD**	**0.486**	0.127	0.178	**0.726**	0.112	0.152	**0.757**	0.111	0.151	**0.470**	0.089	0.120	**0.427**	0.090	0.129
β_E		**0.112**	0.079	0.132	**-0.019**	0.072	0.130	**-0.067**	0.033	0.084	**-0.057**	0.034	0.084	**-0.044**	0.034	0.093
β_T		**0.827**	0.128	0.188	**0.830**	0.128	0.186	**0.886**	0.124	0.173	**0.525**	0.108	0.149	**0.363**	0.095	0.139
β_H	**FTD**	**0.865**	0.120	0.139	**0.881**	0.119	0.137	**0.903**	0.118	0.136	**0.480**	0.089	0.110	**0.336**	0.074	0.098
β_E		**-0.039**	0.069	0.128	**-0.051**	0.068	0.127	**-0.017**	0.056	0.109	**0.001**	0.050	0.095	**-0.058**	0.042	0.090
	2 - INFORMAL															
β_T		**0.296**	0.213		**0.435**	0.182		**0.585**	0.142		**0.476**	0.130		**0.537**	0.146	
β_H	**FD**	**0.543**	0.136		**0.672**	0.122		**0.710**	0.121		**0.448**	0.097		**0.420**	0.107	
β_E		**-0.247**	0.139		**-0.238**	0.134		**-0.126**	0.090		**-0.087**	0.089		**-0.001**	0.098	
β_T		**0.559**	0.173		**0.574**	0.171		**0.551**	0.160		**0.379**	0.140		**0.415**	0.114	
β_H	**FTD**	**0.678**	0.122		**0.686**	0.123		**0.701**	0.123		**0.344**	0.092		**0.257**	0.081	
β_E		**-0.118**	0.125		**-0.112**	0.126		**-0.150**	0.108		**-0.045**	0.102		**0.013**	0.091	
	3 - PRIVATE															
β_T		**0.467**	0.120	0.337	**0.661**	0.111	0.263	**0.679**	0.107	0.229	**0.464**	0.096	0.188	**0.446**	0.094	0.202
β_H	**FD**	**0.467**	0.117	0.332	**0.720**	0.105	0.258	**0.748**	0.105	0.225	**0.467**	0.086	0.182	**0.415**	0.085	0.195
β_E		**-0.001**	0.045	0.137	**-0.060**	0.044	0.138	**-0.070**	0.032	0.049	**-0.059**	0.030	0.049	**-0.013**	0.035	0.054
β_T		**0.796**	0.119	0.211	**0.806**	0.117	0.210	**0.825**	0.114	0.194	**0.478**	0.091	0.169	**0.347**	0.080	0.155
β_H	**FTD**	**0.833**	0.115	0.205	**0.847**	0.115	0.204	**0.870**	0.114	0.190	**0.451**	0.087	0.163	**0.318**	0.069	0.148
β_E		**-0.037**	0.041	0.130	**-0.041**	0.040	0.129	**-0.045**	0.037	0.104	**0.000**	0.033	0.088	**-0.015**	0.033	0.082
	4 - PUBLIC															
β_T		**0.836**	0.329		**0.447**	0.262		**0.627**	0.219		**0.463**	0.188		**0.517**	0.209	
β_H	**FD**	**0.834**	0.330		**0.526**	0.260		**0.701**	0.219		**0.507**	0.186		**0.526**	0.208	
β_E		**0.043**	0.135		**-0.147**	0.139		**-0.055**	0.038		**-0.039**	0.040		**-0.021**	0.041	
β_T		**0.396**	0.204		**0.379**	0.208		**0.495**	0.202		**0.223**	0.178		**0.233**	0.161	
β_H	**FTD**	**0.465**	0.202		**0.455**	0.206		**0.559**	0.202		**0.247**	0.174		**0.270**	0.157	
β_E		**-0.213**	0.122		**-0.239**	0.123		**-0.148**	0.101		**-0.075**	0.089		**-0.077**	0.077	

1) Dependent variable is average hours worked for the working population, average hours worked for those employed and employment rate.
2) Hours and Job elasticities add to Total elasticity for the static but not for the dynamic models:
3) Colum 1 shows raw correlations, and columns 2-5 add time and region fixed effects, controls, 12 and 24 lags of dependent variab $\beta_T = \beta_H + \beta_E$ y.
4) F The test column tests the equality of the coefficients between formal and informal, private and public.
5) Each panel has Within Groups (WG) and OLS on 1st (FD), 12th (TD) and 1st and 12th differences (FTD).
6) Time effects are modelled with year, seasonal-month, stabilization and 1988 structural break dummies.
7) Controls are population and instituional factors.