Minimum wage policies: wage, employment, and distributional impacts in Ecuador

RESEARCH PROPOSAL

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By

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Since 2007 the Ecuadorian Government has used minimum wages as a tool to improve wages. The 2008 Constitution states that, every year, the Government will set and revise the minimum wage (or basic unified minimum wage) established by law. These annual revisions aim to reach decent wages – that should eventually cover the cost of a basic household consumption basket – and reduce inequality. However, the theory indicates that low-wage groups are those that may likely be adversely affected by minimum wages – although the empirical evidence, in particular on employment effects, is not without controversy. Just recently, press news in Ecuador report that there has been a 19% increase in unemployment among the youth in this country. Data on low educated females (such as domestic workers) show also an apparent increase in unemployment.

Ecuador is an interesting case to analyze because – although supposed to be set by Wage Councils –, minimum wages have ended up being set by the Government, who has significantly raised minimum wages, while trying to simplify a complex sectorial minimum wage structure. In addition, other considerations, such as timing of elections may provide the needed exogeneity in minimum wage setting. Thus, in agreement with PAGE thematic foci 2, the main question we propose to address is: What are the effects of minimum wage policies on wages and employment for low-wage workers, in particular for the youth and women in Ecuador? As in other Latin American countries, compliance and informality issues complicate the analysis. We will use data from a national survey (ENEMDU), 2007-2014.
2. Main research questions and contributions

Explain the focus (or key questions) of your research and its policy relevance.

2.1. Explain why you think this is an interesting research question and what the potential value added of your work might be (knowledge gaps). You might want to explain whether or not this question has been addressed before in this context (including key references), and if so, what do you wish to achieve (in addition) by examining the question again?

RESEARCH QUESTIONS
Our main research question is: What are the effects of minimum wage policies on wages, the distribution of wages, and employment of low wage workers, in particular the youth and women, in Ecuador?

When answering this overarching question we wish to address the following issues:
- How well do minimum wage policies in Ecuador target vulnerable workers, namely women and the youth?
- Beyond their direct impacts, do minimum wage policies have (earnings, wage) spillover effects on the informal and above-the-minimum wage groups? That is, how do minimum wage policies affect the wage distribution in Ecuador?
- Have minimum wages had adverse consequences for employment and formality, especially among the youth and women in Ecuador?
- What is the evidence on compliance and minimum wage by firm size and gender for Ecuador?

In answering these questions we shall explore impacts on inequality across gender and age groups. We shall also provide consideration of gender and informality aspects through the inclusion and analysis of relevant variables that should be of particular interest when studying minimum wage policies design in developing countries.

WHY INTERESTING:

The proposed main research question should provide evidence of minimum wage policies design and its impact among the least skilled low-wage workers, in particular women and youth in Ecuador, which is not only a priority issue for the 3rd PEP-PAGE round, but also a key input for current policy discussion in Ecuador. On the policy front the question is interesting because since its coming into power, in 2007, the current Government has pursued an active policy of annual revisions in the structure of minimum wages\(^1\) that aims to improve wages for the lowest paid individuals, yet there has not been discussion as to what have been the impacts of this minimum wages policy on labor market outcomes, wages and employment, of individuals affected. On the academic front, the debate around impacts of minimum wages, in particular on employment, is still unsettled. Moreover, the empirical evidence on impacts of minimum wages in Latin America even though growing in some countries is still scant in others, despite the fact that there are more and more suitable data and policy events that may make the analysis of minimum wages impacts more plausible and interesting.

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\(^1\) In Ecuador there is one basic unified minimum wage, as well as minimum wages by sector; the basic unified minimum wage gives a ballpark for the rest of the wage structure.
WHAT POTENTIAL VALUE ADDED (KNOWLEDGE GAP):

We propose both to contribute to the unsettled debate over minimum wage impacts, and to provide useful information and sound policy recommendations. To do so we shall take advantage of the complex, yet informative (helpful for identification) minimum wages setting in Ecuador. There are multiple minimum wages in Ecuador, according to a structure that depends on industry and occupation. There is also a basic unified minimum wage, which is a referential minimum wage. Sectorial Wage Councils, conformed by representatives from workers, private sector employers, and the Government meet at the end of each year to decide the new minimum wages for the next year. A National Wage Council (CONADES) should also meet at the end of each year and determine the basic unified minimum wage. However, it has been the case that CONADES meetings end with no agreement at all, and then by law the Government (the Minister of Labor) decides what the new basic unified minimum wage is. Sectorial Wage Councils use this basic unified minimum wage as a referential wage, as none of the sectorial minimum wages can be lower than the basic unified minimum wage. The new levels of sectorial minimum wages are published at the beginning of each year in the Official Registry of the Government of Ecuador.

The increase in the referential basic unified minimum wage has been, in fact, well beyond inflation or productivity growth in Ecuador (Ecuador is a dollarized economy, that adopted the US dollar as its own currency in January 2000). It is also important to note that the structure of the sectorial minimum wages points to a (small) reduction in the number of minimum wages over time. Table 1 shows the evolution of the basic minimum wage, inflation rate, and a measure of productivity growth (non-oil real GDP divided by the economically active population) for 2006-2014. This table shows that the increments in the basic unified minimum wage (again, the referential wage for the rest of categories) have been for some years (those which coincide with elections) above the inflation rate and what is suggested by productivity growth. This minimum wage setting, and its evolution, although complex in practice, should render helpful for identification purposes.

Far from being settled, there is an ongoing debate on the impacts of minimum wage policies. We shall also discuss important considerations that economist and policymakers should account for when analyzing minimum wage impacts, highlighted by Neumark and Wascher in their 2006 review of the literature of the so-called new minimum wage research. First, we propose to use several specifications to identify minimum wage effects one of which includes using longer time series-cross section data (Neumark and Wascher suggest panel, but with the survey data available we cannot construct long panel of individuals, only short ones, which we shall also do) that incorporates industry and occupation, as well as time variation in minimum wages. Second, we avoid focusing on narrow industries, instead we take advantage of the complex structure and policy of simplification of minimum wages increases throughout its wage structure to identify minimum wage impacts. Lastly, we shall account for substitution effects within different skill groups, in particular on the least-skilled (lowest wage) who, as suggested in the literature may be the most harmed by minimum wage increases. Among these least-skilled and low-wage individual we may have some youth. We also have women with low level, and even no formal education (such as domestic workers). Employment data from these two groups show increase in unemployment (El Comercio, October 3, 2014; Wong 2013). Table 2 shows that, in comparison to
male wage workers, average wages are lower for women and young wage workers. This table suggests that minimum wages are binding and that the problem of compliance—despite labor inspections in place—may not be improving in Ecuador.

An important consideration when studying minimum wage policies in a developing country such as Ecuador is to account for non-compliance (if any) of the minimum wage (and by whom). In theory a firm should compare the return to noncompliance (which is the avoidance of compliance costs) to the fear of detection costs. The latter in turn depends on the probability of detection (monitoring) and the penalties to be paid if caught not complying. The cost of compliance is different for small and large firms. Minimum wage compliance is expected to be more burdensome for small firms as these firms are expected to have a bigger proportion of low-wage workers (earning below a minimum wage) than large firms; moreover, monitoring costs of the authority could be bigger in the case of small firms. Thus, small firms should more likely want to avoid potential compliance costs (by not paying the minimum wage to their workers), and they expect not to be caught. But even large firms may want to cut the higher costs of minimum wages, in this case by firing minimum wage workers, and the cut may differ by gender—female workers being more likely to lose their jobs after a minimum wage increase (Strobl and Walsh 2003). To enforce compliance in Ecuador the government has implemented labor inspections to establishments and penalty fees for firms that do not comply with minimum wage and other labor rights. The inspections usually take place in large firms. Thus we expect noncompliance to be an issue in small rather than large firms. However, even in large firms, considered formal, there may be some informal firms (that is, firms that do not comply with labor and tax regulations). Nonetheless, the degree of noncompliance in the informal sector should be relatively low in Ecuador (see next subsection for definitions of informal sector in Ecuador). Back in the 1990s, Morrison (1993) (as cited in Strobl and Walsh 2003) found that the degree of noncompliance in the informal sector in Ecuador was 11%. This figure should be lower nowadays as law enforcement has improved and costs of detection have fallen (due to the use of better and more efficient information systems). Notwithstanding the progress, compliance is an issue that should be addressed empirically. The methodology section presents how we propose to do so.

Finally, another potential value added of the proposed research is that we are proposing a study that uses individual level data. We have not come across with any study of minimum wage policies for Ecuador that uses such level of disaggregation. The use of individual-level data and proper econometric methods (including panel) brings its own advantages and disadvantages (that we address in the methodology section), but a key point is that the data provides a rich characterization of individuals and households which is useful for both policy and identification purposes. Although there are minimum wage studies of this type for Latin America, there are still issues of identification, data used, interpretation of results, and policy recommendations that deserve further study. So our proposed study should help close this knowledge gap.

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2 See next section for a definition of small and large firms in Ecuador.
3 Given their higher likelihood of noncompliance to labor and tax regulations of small firms, these firms are considered as part of the informal sector. However, as pointed by Moghadam (1999), p. 374: “The extent of the urban informal sector and its links to the formal sector are matters of dispute.” This author also points that “...women’s involvement in it has not always been captured in the official statistics.” Our study seeks to address these issues. At the same time, we acknowledge the limitations of the data.
Table 1. - National Minimum Wage, 2000-2014

<table>
<thead>
<tr>
<th>Year</th>
<th>Basic Unified Minimum Wage (BUMW) (US$)</th>
<th>Domestic workers, sub-minimum wage (US$)</th>
<th>Inflation rate (%)</th>
<th>Non-oil Sectors Real GDP / PEA, Growth rate (%)</th>
<th>Nominal BUMW, Growth rate (%)</th>
<th>Real BUMW (US$) (2004=100)</th>
<th>Real BUMW Growth rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>160</td>
<td>80</td>
<td>3.30</td>
<td>-</td>
<td>6.67</td>
<td>151.74</td>
<td>3.26</td>
</tr>
<tr>
<td>2007</td>
<td>170</td>
<td>120</td>
<td>2.28</td>
<td>-</td>
<td>6.25</td>
<td>157.63</td>
<td>3.88</td>
</tr>
<tr>
<td>2008</td>
<td>200</td>
<td>170</td>
<td>8.39</td>
<td>6.37</td>
<td>17.65</td>
<td>171.08</td>
<td>8.53</td>
</tr>
<tr>
<td>2009</td>
<td>218</td>
<td>200</td>
<td>5.20</td>
<td>-1.83</td>
<td>9.00</td>
<td>177.32</td>
<td>3.65</td>
</tr>
<tr>
<td>2010</td>
<td>240</td>
<td>240</td>
<td>3.56</td>
<td>5.76</td>
<td>10.09</td>
<td>188.52</td>
<td>6.31</td>
</tr>
<tr>
<td>2011</td>
<td>264</td>
<td>264</td>
<td>4.47</td>
<td>6.07</td>
<td>10.00</td>
<td>198.49</td>
<td>5.29</td>
</tr>
<tr>
<td>2012</td>
<td>292</td>
<td>292</td>
<td>5.11</td>
<td>3.63</td>
<td>10.61</td>
<td>208.88</td>
<td>5.24</td>
</tr>
<tr>
<td>2013</td>
<td>318</td>
<td>318</td>
<td>2.73</td>
<td>0.52</td>
<td>8.90</td>
<td>221.45</td>
<td>6.02</td>
</tr>
<tr>
<td>2014</td>
<td>340</td>
<td>340</td>
<td>3.59</td>
<td>3.75</td>
<td>6.92</td>
<td>228.57</td>
<td>3.21</td>
</tr>
</tbody>
</table>

Sources: Wages taken from Official Registry of the Republic of Ecuador, Inflation rate and PEA taken from the National Institute of Statistics and Census (INEC), and GDP from the Central Bank of Ecuador.

Notes: 1.- Inflation rate corresponds to the monthly average inflation rate. Real minimum wage is calculated using the monthly average CPI per year (2004=100). 2.- Economically active population (PEA, by its acronym in Spanish) corresponds to 15-64 year-old who worked at least one hour in the reference week, or even if they did not work, they had a job (employed), or those who were unemployed but were available for work and were seeking for a job (unemployed). From 2007 on, there was a change in methodology to measure unemployment in the survey. PEA data corresponds to December of each year, except for 2014, that corresponds to June 2014. 3.- In Ecuador domestic workers are mostly women with low level of educational attainment.

Table 2. - Average wages in relation to national minimum wage and share of wage workers

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Population</th>
<th>Total mean</th>
<th>Total median</th>
<th>Total p10</th>
<th>Male Population</th>
<th>Male mean</th>
<th>Male median</th>
<th>Male p10</th>
<th>Female Population</th>
<th>Female mean</th>
<th>Female median</th>
<th>Female p10</th>
<th>Youth (15 - 24 yr) Population</th>
<th>Youth mean</th>
<th>Youth median</th>
<th>Youth p10</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>2,737,418</td>
<td>208.35</td>
<td>162.68</td>
<td>68.33</td>
<td>1,842,820</td>
<td>218</td>
<td>177.32</td>
<td>81.34</td>
<td>894,597</td>
<td>188.45</td>
<td>162.68</td>
<td>81.34</td>
<td>750,454</td>
<td>153.01</td>
<td>146.41</td>
<td>65.07</td>
</tr>
<tr>
<td>2010</td>
<td>2,747,022</td>
<td>222.27</td>
<td>188.52</td>
<td>78.55</td>
<td>2,706,757</td>
<td>228.61</td>
<td>198.48</td>
<td>90.22</td>
<td>2,088,881</td>
<td>208.57</td>
<td>188.52</td>
<td>90.22</td>
<td>700,751</td>
<td>165.08</td>
<td>170.45</td>
<td>65.07</td>
</tr>
<tr>
<td>2011</td>
<td>2,706,757</td>
<td>230.09</td>
<td>198.48</td>
<td>90.22</td>
<td>2,789,210</td>
<td>235.24</td>
<td>201.03</td>
<td>107.3</td>
<td>2,789,210</td>
<td>241.42</td>
<td>208.88</td>
<td>107.3</td>
<td>623,540</td>
<td>178.37</td>
<td>180.44</td>
<td>65.07</td>
</tr>
<tr>
<td>2012</td>
<td>2,789,210</td>
<td>241.42</td>
<td>208.88</td>
<td>107.3</td>
<td>3,158,232</td>
<td>244.13</td>
<td>211.03</td>
<td>110.32</td>
<td>3,158,232</td>
<td>266.45</td>
<td>221.45</td>
<td>110.32</td>
<td>609,429</td>
<td>200.3</td>
<td>203.34</td>
<td>65.07</td>
</tr>
<tr>
<td>2013</td>
<td>3,158,232</td>
<td>266.45</td>
<td>221.45</td>
<td>110.32</td>
<td>2,146,894</td>
<td>274.11</td>
<td>221.45</td>
<td>110.32</td>
<td>2,146,894</td>
<td>281.06</td>
<td>221.45</td>
<td>110.32</td>
<td>2,146,894</td>
<td>274.11</td>
<td>221.45</td>
<td>110.32</td>
</tr>
</tbody>
</table>

Source: Own construction using survey data (ENEMDU) from the National Institute of Statistics and Census (INEC).
Minimum wage effects on employment and hours, and distribution of wages have been addressed before, but mostly in the context of developed countries. The present research—given its context, data availability, and econometric techniques to be applied—should contribute with sound evidence to the minimum wage debate for a developing country. 4

Canelas (2014) in the first study, that we know of, that addresses the employment and wage impacts of minimum wages in Ecuador. To do so she uses province-level data and applies standard equations found in the so-called new minimum wage literature (e.g. Card and Krueger 1994), that rely on geographical variation to identify employment and average wage impacts of minimum wages. Several of this type of studies find positive or no evidence of employment costs of minimum wage increases. Canelas is no exception, however, we shall point to some issues that we consider worth revisiting and improving in this study. These issues relate to the data used, identification, and interpretation of results. We also highlight some of the interesting data findings from it.

Canela's study uses ENEMDU data of December for the period 2000-2012, and aggregates the data at the province level. In using these data the aim of her study is to capture impacts with a long pseudo panel. However, the problem in using this period is that there is a break in the survey because the definition of employment changed in 2007, that is, there is one definition before September 2007 and another in and after September 2007, as the questions that defined employed versus unemployed in the survey data were changed. There may be need to address to what extent this change in definition affect results on her analysis of impacts on employment.

Another problem in choosing such period is that the early 2000s were years of adjustment to one of the worst economic crisis that suffered Ecuador, which ended up with the adoption of the US dollar as the new currency for this country in 2000; we expect this to have impacts on labor markets that may pose problems for the identification strategy—by generating different trends in labor markets growth in different provinces (e.g. probably more dynamic provinces such as Guayas and Pichincha adjusting faster than others). 5,6

Concerning the interpretation of the results in Canelas, even though her findings do not show

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4 Betcherman (2014) is one recent document that provides a literature review on the impacts of labor market regulations in developing countries.

5 Also, for the case of Ecuador is not straightforward to expect wide variation in minimum wages across provinces because variation does not come from differences in the setting of the minimum wages by a subnational jurisdiction (such as provinces). In Ecuador, minimum wages are set only at the national level, by industry/occupation. In this way Canelas' study may suffer from some identification issues as the control group for the implied difference-in-difference approach is not properly set. In any event, it may seem important to examine the subnational levels employment data before and after a minimum wage increase to see if there is a systematic pattern of differences between any low-wage or high wage subnational territory, because if the traditional view were true—and the minimum wage increase would affect negatively low-wage employment—the increase in the national minimum wage would reduce employment in low-wage subterritories relative to higher-wage subterritories.

6 Assuming the choice of the period does not pose the challenges discussed above, another modeling issue in her employment equation is the lack of a term to control for differences in economic trend by territory. This issue has been lately discussed in the literature (see for instance Neumark et al 2013).
evidence of employment cost - on the contrary there are positive and significant employment
effects for formal and informal workers - and show positive and significant effects on wages, the
author concludes that “policy interventions [on minimum wages] should be redirected…”
(Canelas 2014, p. 18). But her findings of positive wage and employment effects of minimum
wages do not call necessarily for a redirection of this policy. Moreover, assuming her study has a
proper identification, there may be reasons why the results show positive impacts on
employment. For instance, the literature cites monopsony labor markets as an explanation if
positive or no employment effects of a minimum wage rise are found (Canelas cites this
explanation, although not when explaining her results). Other explanations include: the choice of
period (as already discussed above); that there may have been adjustments in hours, not in jobs;
or simply that, the effects may be really small to be captured by the data used (although as we
have shown in Table 1 above, there are some years in the late 2000s and early 2010s when there
have been significant increases in minimum wages, so we would expect impacts on employment
and wages to show). These results show that more studies on the wage and employment
impacts of minimum wage policies in Ecuador may be needed.

Canelas presents interesting evidence on whether the minimum wage is binding, and on
informality and compliance (high ratios of minimum wages to average wages, and spikes in the
kernel densities). Her results may confirm what is expected for Ecuador: the basic unified
minimum wage is binding and there may be some issues with respect to compliance and a large
informal sector in Ecuador. 7

However, coincidences in spikes in actual wages and the minimum wages may be caused by
reasons other than the minimum wages (Gindling and Terrell 2004). The issue of compliance
must be explored further by dividing the household survey data between workers that work for
firms with 10 or fewer workers (small firms) which do not hold accounting or tax records versus
workers that work for small firms that have those records and for firms that employ more than 10
workers. This is important because the government has implemented visits to medium and large
firms as an enforcement mechanism, we expect larger firms to comply, while in small firms we
may expect less of a perfect compliance with minimum wage and labor rights – in particular in
those small firms with no bookkeeping and tax records. Concerning compliance Strobl and Walsh
(2003) present precisely evidence of noncompliance in small firms in Trinidad and Tobago.

Another key reference is Gindling and Terrell (2007) because of the Ecuadorian multiple minimum
wages setting and trend to simplify the wage structure that are both similar to the situation in
Costa Rica analyzed by those authors.

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7 Canelas (2014) uses three types of definitions for informal workers, customary in the literature. Informal 1: independent
or self-employed individuals. Informal 2: all workers, salaried or not, who are not affiliated to the social security system.
Informal 3: all salaried workers employed by small firms with less than 5 employees plus all independent and self-
employed individuals. We will follow similar definitions for informal, except that in the third definition we take as small
firms those firms with 10 or less than 10 employees (as it is usually applied by the National Institute of Statistics and
Census). For more on the measuring of the Informal Economy in Latin America and the Caribbean see Vuletin (2008).
IF SO, WHAT DO YOU WANT TO ACHIEVE

As in Gindling and Terrell we want to understand the impacts of the minimum wage policies on employment, wages and the wage distribution. In particular on the low-wage low-skilled individuals (women and youth) and substitution effects that may affect most negatively these individuals. That is, unlike in Gindling and Terrell, given the relevance for the case of Ecuador (and for this PEP-PAGE call for research proposals), we focus the discussion about the minimum wage impact on both the youth and female low-wage low-skilled workers. Analysis of minimum wage impacts on these types of workers is important because indicators in Ecuador suggest negative results on employment for both the youth and female workers, as noted in the previous and next section. To do so we shall use what we argue are exogenous wage variations coming from both the variation in the complex wage structure of minimum wages in Ecuador and the timing and magnitude of the changes in the minimum wage. To the best of our knowledge, there is only one previous study (Gindling and Terrell 2007) that uses the complex minimum wage structure – common to many Latin American countries– to study minimum wage impacts. Their study, unlike our proposal, focuses on employment effects.

Another value added of our proposal is that we look into wage effects of minimum wage changes throughout the distribution of wages and by formal and informal sectors. These results shall provide valuable policy input for Ecuadorian policy makers, as in this country, like in many other developing countries, policymakers are concerned not only about whether minimum wages unintendedly lead to “informalization” of their economically active population but also about whether or not minimum wages are effectively targeting the intended population and what impacts on wage inequality minimum wages may have.

Yet another value added of our proposal is that we explore empirical evidence of noncompliance in Ecuador in the context of minimum wage increases –which, to the best of our knowledge has not been addressed before for this country. The empirical evidence on noncompliance is still scant for developing countries, despite being a key issue for minimum wage policies in this type of countries (see Gindling and Terrell 1995, and Strobl and Walsh 2003).

In summary, what we want to achieve with our study is: (i) sound evidence using data at the individual and household level on the impacts of minimum wages policies in Ecuador with special attention to those presumably most likely to be affected negatively by such policies: low-wage wage workers, in particular some youth and female workers. (ii) At the same time we want to start the minimum wage policy discussion in Ecuador, key to elevate this policy to a good economic policy status (as stressed by Neumard and Wascher 2006). (iii) By doing both, we want to contribute to the unsettled and ongoing academic debate on minimum wage impacts, in the context of a developing country.

2.2. Describe the specific policy issues/needs that your research aims to address; how your potential outcomes/findings may be used in policy making?

- Justify timing of your research in terms of policy and socioeconomic needs/context – e.g. reference to existing/planned/potential policies at the national level.
Evidence of previous consultation with potential users (e.g. policymakers and key stakeholders) to help define your research question is strongly encouraged. Include a list of names, institutions and email addresses when possible.

SPECIFIC POLICY ISSUES/NEEDS/USE:

The Ecuadorian Government has purposely used minimum wages as a tool to improve wages since 2007. The Constitution of this country –enacted in 2008– states that, every year, the Government will set and revise the basic unified minimum wage established by law, and the application thereof shall be general and mandatory. This annual revisions will be progressive and aim to reach a decent wage (“salario digno”). This basic wage should cover the cost of a basic household consumption basket. However, the theory indicates that low-wage groups are those most likely to be adversely affected by minimum wages –although the empirical evidence is not without controversy, in particular concerning employment impacts. Just recently, press news in Ecuador report that there has been a 19% increase in unemployment among the youth (15- to 30-year old) in this country (El Comercio, October 3, 2014). Data on domestic workers (most of whom are low educated females) also show an apparent increase in unemployment (Wong, 2013).

From a policy making point of view, another very important event nowadays in Ecuador is a debate around a new Labor Code proposed by the Government. The reforms were supposed to be widespread (although recently they have been downscaled), including topics about unions (currently unions have weak or no bargaining power in Ecuador, any change in this situation should have an impact in terms of minimum wage setting and impacts), rights to strike, etc.

Taking advantage of this debate, our proposed research should give the needed input –to those discussing labor reforms– to start thinking about the design of minimum wage policies in Ecuador so that these policies contribute effectively to improving the economic situation of Ecuadorian households, and reducing inequality (a key government goal), without unintended consequences on employment (negative for low-wage workers) or wages (spillover effects in the up position of the wage distribution). Perhaps the results may shed light as to why in Ecuador there are still high rates of informality rates (as discussed in recent ILO meetings in Peru, see El Comercio October 17, 2014).

Our study should offer insightful results for policymakers because for Ecuador, as noted before, there may still be a high proportion of individuals for whom the minimum wage is expected to be binding (who should be the most vulnerable, such as some youth and women), there are issues of compliance and large informal sectors (see previous and next section), there is a need to inform on how well minimum wages are targeted, and last but not least there are still poverty and inequality issues. Granted, according to data from the National Institute of Statistics and Census (INEC), poverty and inequality have fallen in Ecuador (national incidence rate, measured by income, fell from 36.7 in 2007 to 22.5 in 2014; inequality, measured by the Gini coefficient, fell from 0.55 in 2007 to 0.47 in 2014). However, poverty still remains high in rural areas (35.3 in 2014) and in households where the head is a woman (compare, in urban areas for women 16.2 versus...
men 12.1; in rural areas poverty incidence for women and men present similar high incidence when measured by income: 29.1 for women and 30.3 for men).\(^8\) Not surprisingly unemployment rates are particularly higher for women than for men (at the national level is 5.7 for women and 4.0 for men; in urban areas is 6.6 for women and 5.1 for men; and, in rural areas is 3.19 for women and 1.82 for men). Unemployment rates are also particularly high for the youth, standing at 15.9 in urban areas, and 6.9 in rural areas for individuals 15-24 year old, the highest unemployment than in any other age group. Our results aim to provide useful and sound information for policymakers on those issues, so that they can better target minimum wage policies.

When studying compliance to minimum wage by size of firms and gender, we hope to offer evidence for policymakers such as, that it is large firms the ones who may comply whereas small firms may not, in which case, policies may want to focus on how to help small firms bear the higher costs of minimum wages. However, even if large firms comply with minimum wages it is possible that, when facing large increases in minimum wages, these firms fire or lay off workers, in particular female workers. The literature has pointed evidence of such cases (see Strobl and Walsh 2003 for Trinidad and Tobago). In these cases, perhaps social insurance policies targeted to females workers (heads of household) may help in alleviating their unemployment situation.

Through a previous research on the impacts of mandatory social security enrollment for domestic workers in Ecuador, we have established contact with Directors of the Social Security Institute in Guayaquil and Quito, whom we expect to be interested in the proposed research on minimum wage policies. We have recently contacted the Ministry of Labor (see letter attached), the institution in charge of coordinating minimum wages setting every year (in Ecuador contacts with high-ranked dignitaries should be done by letter).

**EXAMPLE OF EVIDENCE OF PREVIOUS CONSULTATION WITH POLICYMAKER:** See letter below.

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\(^8\) Also, by occupation of the household head, poverty still remains high in some households: if self-employed (27.7), blue-collar worker or pawn (31.2), unpaid household worker (32.9), unpaid non-household worker (43.7), or domestic worker (12.6 in urban areas, but 53 in rural areas).
**Name** | **Title** | **Institution** | **Email**  
---|---|---|---  
Carlos Marx Carrasco | Minister | Ministry of Labor | carlos_carrasco@mrl.gob.ec  
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Maritza Zambrano | President | Asociación de Trabajadoras Remuneradas del Hogar (ATRH) | asociaciontrh@hotmail.com
3. **Methodology**

Presentation of the specific techniques that will be used to answer the research questions and how exactly they will be used to do so. Explain whether you will use a particular technique normally used in other contexts or whether you intend to extend a particular method and how you will do so. Explain if these methods have already been used in the context you are interested in (including key references).

The proposed estimation strategy is divided in four parts, according to the set of research questions and methods that we address in each of them. In *part 1*, we propose to lay out key definitions for the estimation, expected results, and results from data tabulations by groups of interest (in this proposal we already show some of the key definitions and data tabulations) including a discussion about informality. In *part 2* we address minimum wage impacts on wages and distribution of wages in Ecuador. In *part 3* we address the impacts of minimum wage policies on employment. *Part 4* addresses compliance to minimum wage increases in Ecuador. Furthermore, in the corresponding sections we provide the general identification strategy for analyzing effects of minimum wage policies in Ecuador, including robustness checks.

1. **Minimum wage policies effects on wages, employments, and distribution of wages: General overview**

To answer the broad question of what are the effects of minimum wage policies in Ecuador on employment and wages, in particular of the least skilled low-wage workers (youth, females), we follow the estimation strategy in Gindling and Terrell (2007). We follow their estimation strategy because it relies on minimum wage setting features in their country of analysis (Costa Rica) that are similar to those in Ecuador. These features are: (i) In Ecuador there are different minimum wages (for which the basic unified minimum wage serves as the reference wage). Minimum wages may differ by industries/occupations, and maybe increased by different percentages every year during the period under study –moreover, there seems to be a consolidation and reorganization of the complex wage structure in Ecuador in the last years, although not as aggressive as it was the case in Costa Rica in the 1990s; and, (ii) Size of minimum wage increases have not been based solely, we argue, on the rate of inflation or in any other force related to either demand or supply conditions in the labor market, but on exogenous factors (to the economy and labor markets) such as election timing.

These features not only give variation in the minimum wage, beyond that provided in one national or state minimum wage (as has been the case in the developed country literature), but also should make those variations exogenous –which is key to avoid endogeneity/simultaneity bias that may exist when comparing changes in a single minimum wage to changes in actual wages and employment.

Important issues to account for in a minimum wage study for a developing country are incidence, compliance and informality. We propose to do so following the literature (see, for instance, Maloney and Nunez 2004, Strobl and Walsh 2003).

- **First**, we analyze, for every year in our data survey, how binding the basic unified minimum wage is (the reference wage for other minimum wages) by checking the level of this minimum wage relative to a central tendency measure: first the mean, then the median (known as less
sensitive to extreme values), and finally the 10th quantile of the distribution of wages.\textsuperscript{9} We also check for variance and skewness. We do this for the whole sample of salaried workers and by types of salaried workers (by gender, and age group), 15-64 year old, working 30-50 hours per week. How high is the percentage of salaried workers earning the minimum wage with respect to each of these measures will give us how binding minimum wages are (through time) in Ecuador. That is, we will briefly revisit the results in Canelas (2014) on how binding the minimum wage is, but unlike Canela’s we focus on the youth and women, that are our groups of interest.

- Second, we seek spikes in the wage distribution around the basic unified minimum wage and other key minimum wages (see for instance, Neumark et al. 2000), using histograms, kernel density functions, and cumulative density functions; we do this for covered and uncovered groups (for the definition of covered and uncovered groups, see next paragraph). But unlike Canelas for Ecuador, we look for spikes that correspond to the multiple (not just the basic) minimum wages for two years of the data. As pointed out by Maloney and Nunez, a “piling up” of the probability mass around a minimum wage (vertical lines in those density functions) suggests that such policy has forced a change in the distribution. Comparing the shapes of these distributions between covered and uncovered groups should give an indication of the compliance with minimum wages (and if there are some “lighthouse effects”, that is, spillovers from the covered –wages– to the uncovered –wages or earnings).

- We also use kernel density functions to start our discussion on compliance issues by groups of interest. We focus this discussion on a minimum wage increase, with a sizable increase (e.g. January 2010 or January 2013) that can arguably be taken as exogenous due to its timing (2010 and 2013 were election years). As in Strobl and Walsh (2003), we estimate kernel densities of the wage distribution for two periods (say June 2012, and December 2012) before the minimum wage increase and compare the changes between them (in this case no change due to minimum wage is expected because the data is in between changes). We also estimate and depict, in another graph, the kernel densities of the wage distribution for a period before (say December 2012) and a period after (say June 2013) and look for any change in the shape of the kernel density functions. Both comparisons are done by size of firms (large, small) and gender (male and females low-wage workers). If compliance is an issue for small firms we expect to see identical shape of kernel densities in small firms as these firms would not have implemented the minimum wage increase. If compliance is not an issue for large firms, and they enforce the minimum wage increase, there should be a spike at the minimum wages and a shrinking of the lower tail of the distribution. In both cases there may be differences by gender (e.g. we could expect less compliance or lack of compliance for the case of female workers and the youth). Later on, in section 4, we lay out how we plan to further address identification of minimum wage compliance and labor outcomes in Ecuador using the panel data available.

A key point in the studies of impacts of minimum wages is how to measure both the treatment (covered) group and the control (uncovered) group.

- The treatment group are those salaried workers covered by the minimum wage law. In

\textsuperscript{9} Canelas (2014), as cited above, presents evidence on how minimum wages relate to averages (at the province level) and concludes that the minimum wage really bites in Ecuador.
Ecuador this group used to include private sector workers, except for domestic workers, handicraft workers, and workers of microenterprises, for whom there was a subminimum wage. However, starting 2010 all private sector workers are covered by the unified basic minimum wage. Public workers are excluded, although, according to the law, public workers cannot earn less than the basic unified minimum wage, thus we will exclude public workers from both our treatment and control group. Domestic workers (mostly low-skill women) used to receive a subminimum wage that the current government rapidly raised to the level of the basic unified minimum wage (starting in 2007 until it reached the same level of the basic unified minimum wage in 2010).

Guided by this definition of covered workers, we take as uncovered workers (the control group) the self-employed (including “patronos”) and unpaid family workers (as in Gindling and Terrell 2007, who unlike Maloney and Nunez 2004, exclude salaried workers working in small firms; in Ecuador small firms are those that employ 10 or fewer workers). We shall test for robustness of the results using also a definition of uncovered similar to the one used by Maloney and Nunez. That is, in addition to self-employed and unpaid family workers, we also include salaried workers working in small firms that do not have accounting and tax records as another definition of control (uncovered) group. We can use a third definition: those workers (salaried or not) that are not enrolled in social security—as it has been customarily used in the literature.

In summary, we use three alternative definitions of control, uncovered, or as called in the literature “informal” workers: (1) self-employed and unpaid family workers, (2) self-employed and unpaid family workers plus salaried workers working in small firms with no accounting records and not tax records, and (3) workers (salaried or not) not enrolled in social security.¹⁰

The presence of a large informal sector is long known in Latin America and the Caribbean (see for instance, Maloney and Nunez 2004, and for a more recent study see Gasparini and Tornallioni 2009). Ecuador is no exception. Moreover, recent data for Ecuador suggests that the proportion of informal workers has increased in some years. According to Figure 1, there is a higher proportion of informal workers (over 50% in most years during the last seven years for which the data is strictly comparable) than formal workers. In Figure 1 low increases in minimum wages seem to be associated with a higher proportion of formality (years 2007, 2009, and 2014). On the contrary, higher increases in minimum wages (years 2008, 2010-2013) seem to go hand-in-hand with reductions in the proportion of formal sector workers, and an increase in informality. Whether workers in the formal sector are being pushed out and into the informal sector (or unemployment or inactivity) because of minimum wage increases may depend on both the size and the enforcement of the minimum wage increase. It may also depend on whether workers see the informal sector as a sector of choice or as a sector of last resort (Gindling and Terrell 2005). Whether this is good or bad for the workers and the economy depends on what earnings the workers get as formal or informal. We propose to explore these issues analyzing data of workers

¹⁰ Strictly speaking, even workers in small firms should be earning the minimum wages, that is, they should be considered “covered workers” (although it is only since 2010 that the law states that all private workers should earn the minimum wage). However, the definitions above acknowledge the fact that for small firms with not tax and accounting records the minimum wage enforcement is rather non-existent. So this group of workers will be considered informal and not covered.
by groups of interest.

Again, an issue, noted already in the literature is whether minimum wage increases have led to an increase in the employment in the informal sector (“informalization”). In a competitive two-sector model, an increase in minimum wages should lead to a lower employment and higher wages (of those who still remain employed) in the covered (formal) sector and higher employment and lower wages in the uncovered (informal) sector. \(^{11}\) Figure 1 shows a pattern for Ecuador that is more or less consistent with the hypothesis that minimum wage policies may have some role to play in the growth of the proportion of informal workers, as (big enough) higher minimum wages seem to have pushed workers out of the formal sector and into the informal sector. Our proposed study aims to shed light on this question, not only for the total number of workers but also by group of workers of interest (the youth and women).

![Figure 1](image)

**Figure 1.** Real minimum wage growth and informality in Ecuador, 2007-2014 \(^{12}\)

Source: Official Registry (‘Registros Oficiales’) of Ecuador and the National Institute of Statistics and Census (INEC).

Notes: 1.- Real minimum wage is calculated using the monthly average CPI per year (2004=100). 2.- Data for formal and informal workers taken from National Survey of Employment, Unemployment and Underemployment (ENEMDU) of INEC and it is from June of each year at national level, except for 2009 when it refers to urban areas. 3.- Formal refers to employed persons aged 15 and over working in establishments with more than 10 employees and employed persons working in establishments employing up to 10 workers, who have an identification number (RUC, acronym in Spanish) and complete accounting records. 4.- Informal refers to the group of production units, according to the definitions and classifications of the System of National Accounts of the United Nations, as part of the household and household enterprises sector; i.e., as companies belonging to households and are not constituted as societies. Within the household sector, the informal sector comprises: i) “informal business people working Own-account “, ii) an additional component consisting of enterprises of informal employers “. Informal workers includes employed persons aged 15 and over working in establishments that employ 10 or less workers, that do not have tax identification number (RUC, acronym in Spanish) and that have no complete accounting records.

\(^{11}\) However, other models may predict different results for either employment or wages in the uncovered (informal) sector.
2.- Estimating wage effects of Minimum Wage policies

Wage effects

When deciding the methodology for the estimation of the wage effects of minimum wage policies we believe that there are two important considerations. On the one hand, econometric considerations: we know that one method to find changes while attributing causality that uses panel data (out type of data available) is the difference-in-difference approach. This approach may control for variables that may affect the outcome but are not related to the policy of minimum wages (unconfoundness effects). This approach boils down to having a proper treatment group and a proper control group (as a counterfactual). And the key question (again) is how to construct both the treatment and control groups, while having a proper identification strategy to disentangle wage impacts of minimum wages. On the other hand, we have to take into account data limitations: with the Ecuadorian survey data we can only construct short panel data. Thus as a first approximation for the estimation of the minimum wage impacts throughout the wage distribution we rely in the method of identification set by Card (1996) (also used in Gindling and Terrell 2007 for their analysis of employment impacts).

Effects throughout the wage distribution

As stressed in the literature (see for instance Neumark and Wascher 2006), the effects of minimum wages should be most likely felt by those in the lower tail of the initial distribution of wages. To explore this issue several authors have analyzed what is known as the effect of changes in minimum wages throughout the distribution of wages or skills. We follow such literature to provide evidence on whether covered workers in the lowest tail of the skill or wage distribution in Ecuador (presumably low-educated female and youth and/or some other formal workers) should be the ones most significantly affected (positively) by changes in minimum wages. Other groups might also be affected by minimum wages (spillover effects, that is, on wages of the higher end of the wage distribution; or, in earnings of informal sector workers). Thus, we want to study what happens with the distribution of wages (earnings) and to measure how inequality may change due to minimum wage policies in Ecuador.

The study of what happens with the wage (earnings, for uncovered self-employed) distribution is important not only to measure how minimum wages affect wage (earnings) inequality, but also because ignoring what happens with spillovers may lead to underestimations of the wage bill which in turn may lead to wrong estimates of the effects on prices and profits (Stewart 2012) -the latter are important indicators for a policymaker.

When thinking about minimum wage impacts in the distribution of wages we would like to address two issues:

a) Control for individual selection into the covered and uncovered groups, as in Card (1996) who control for differences in the individuals covered (unionized) versus uncovered (non-unionized) which may affect the distribution of wages (over any potential minimum wage effects). This implies to gather data for both covered and uncovered, that is, make comparisons across different distributions. (Note: Card 1996 also addresses potential influence of errors in
measurement—in the type of data he uses). Addressing the construction of the proper treatment and control groups would in turn allow us to properly address inequality.

b) Spillover effects, that is, effects of minimum wages on wages of those individuals earning above the minimum wage (or in informal sectors).

To study changes in the distribution of wages while controlling for individual selection we propose to follow the method developed by Card (1996), and also applied by Gindling and Terrell (2007) where the first step is to estimate a (counterfactual) wage equation for the uncovered workers using 2007-2013 data applying the equation:

\[
\ln W_{it}^u = \alpha_0 + \sum_{t=1}^{T} \beta_j^u X_{ijt}^u + \sum_{t=1}^{T} \gamma_t^u Y_t + \sum_{t=1}^{T} Y_t \left( \sum_{h=1}^{H} X_{iht}^u \rho_{ht}^u \right) + \mu_{it}^u
\]

(1)

Where, \(i\) indexes individuals, \(j\) industry/occupation, \(t\) time. \(X\) includes controls for individual characteristics such as age, education and its quadratic, a dummy for gender. The superscript \(u\) refers to “uncovered”. \(Y\) controls for time effects. We also will control for regional effects. \(\mu\) is the error term.

The basic idea behind Card’s method is that the minimum wage (union wage in Card’s study) effect may vary with the level of the worker’s skill, and that the selection process into a minimum wage job "may lead to a differing selection biases at different skill levels" (Card 1996, p.969), and thus he suggests to apply the model above separately for different skill groups. Card defines the groups by quintiles of predicted wages. We shall (instead) create deciles from the distribution of predicted wages. As stated before, to get this predicted wages he estimate first the model in the uncovered (non-union, in his study) sector. These cut-off points for deciles given by the predicted wages are, in turn, used after the model is estimated with data for covered sector (unionized workers in Card’s study). Finally, the method compares: (1) wages within deciles in the same distribution (for both covered and uncovered), and (2) wages for each decile, of both covered and uncovered workers, that is, across distributions. The latter are the comparisons that reveal the interesting patterns according to Card (1996).

Unlike Gindling and Terrell (2007), we are not only interested in changes in wages in covered (formal) and uncovered (informal) sector workers but also in how female workers and the youth fare in these patterns. So, we shall extent the analysis to these groups of interest, analyzing the data accordingly.

**Difference-in-difference (DID) approach.**

In this section we propose to study wage impacts using the minimum wage sectorial setting and panel features of the proposed data (ENEMDU, see data section). An interesting methodological contribution that we propose to explore is the use of the difference-in-difference approach to analyze wage impacts. This would be a standard difference-in-difference approach (See Angrist and Pischke 2009) using a pool of two- and four-period panel data, as shown by the periods enclosed by squares in Table 3 of the data section.
There are several issues to be addressed:
- Choice of the before and after period: we can only construct short-run periods which limits our ability to control for long trends in the estimation. If differences in trends between the two groups (treatment and control) occur due to factors other than the minimum wage, the estimation will be invalid or biased (Gertler et al 2011). We can do so for several two quarters (minimum wages are published and take effect at the beginning of January, thus the before period would be December, and the after period would be March, of each year starting (December) 2007 and ending (March) 2014 –only for urban areas).
- Treatment and Control groups: in the treatment group are (low) wage workers subject to minimum wage: private wage workers, pawn, “tercerizados”, and paid domestic workers (that are earning below the minimum wage to be set in the next period). In the control group are –as before– uncovered workers that include the self-employed (including “patrones”) and unpaid domestic workers.
- Identification strategy and robustness checks: We include time and regional effects. The estimates may be sensitive to controlling for time and region effects, and according to Lemos (2007), modelling time and region effects helps with the identification of the minimum wage impacts. In this regard, difference-in-difference may be less robust that randomized selection methods (Gertler et al 2011), but randomization is not an option for our study. As robustness check, we use other two alternative control groups (see section 1).

Thus the basic DID model to be estimated is:

\[
\ln w_{ijt} = \beta_o + \beta_1 POST_t + \beta_2 MWworker_{ijt} + \beta_3 POST_t \times MWworker_{ijt} + \beta_4 X_{ijt} + \eta_{it}
\]

(2a)

Where, as before, \(i, j,\) and \(t\) index individual, industry/occupation, and time, respectively; \(w\) is the real wage of individual \(i\) in industry/occupation \(j\) at time \(t\). \(POST_t\) is the time dummy that equals to 1 if the period is after the minimum wage increase (March) and 0 if before (December). \(MWworker_{ijt}\) is the dummy that equals to 1 if the individual is a wage worker subject to minimum wage, and 0 if in the control group.

The coefficient of the interaction term (\(\beta_3\)) or the difference-in-difference term captures the differences in wages between the treatment and the control group in the post minimum wage increase period. \(X_{ijt}\) controls for various worker characteristics such as age, education, and race. We will also include time (year-quarter) fixed effects, as well as regional fixed effects. We will run separate regressions for male and female individuals.

In another specification we have a DID model that tests for whether larger minimum wage increases have a bigger impact on real wages of (low) wage covered workers:

\[
\ln w_{ijt} = \beta_o + \beta_1 POST_t + \beta_2 \Delta MW_{ijt} + \beta_3 POST_t \times \Delta MW_{ijt} + \beta_4 X_{ijt} + \eta_{it}
\]

(2b)
Where all indices and variables are defined as before. The minimum wage increase variable \( (\Delta MW_{ijt}) \) is a constructed variable that identifies individual, occupation and time variation in real minimum wage:

\[
\Delta MW_{ijt} = \ln \left( \text{Minimum Wage at } t \right) - \ln \left( \text{Minimum Wage at } t-1 \right)
\]

For each individual \( i \), on industry/occupation \( j \). For this specification we use a panel of four periods (December 2011, March 2012, December 2012, and March 2013). Again, see Table 3.

In equation (2b) the coefficient \( \beta_3 \) represents the difference-in-difference parameter that measures how much more wages changed in the post-minimum wage period whenever the minimum wage gap was largest.

### 3.- Estimating Minimum Wage policies effects on employment

We start our study about the minimum wage impacts on labor outcomes in Ecuador analyzing the employment effects. As in Gindling and Terrell (2007), we estimate an employment equation using a cross-section time-series annual data. Our period of analysis is 2011-2014 (see data section for a description of the proposed database). For the impacts on employment the equation to be estimated is:

\[
[EMP_{it}] = \alpha_0 + a_1 \ln MW_{it} + X'_{it} \beta + \delta VA_{mt} + \sum_{j=1}^{J} \lambda_j OCC_{itj} + \sum_{t=1}^{T} \gamma_t Y_t + \mu_{it}
\]

Where, \( i \) is an index for individual; \( m \) is an index for industries; \( j \) indexes industry/occupation categories; and, \( t \) time.

\( EMP_{it} = 1 \) if the worker is employed in the covered sector, and \( = 0 \) for the self-employed, unpaid family workers (the uncovered sector), and for those not in the labor force and unemployed workers (for whom is not possible to assign an occupation and minimum wage. See Gindling and Terrell, 2007). Or, in another specification: \( EMP_{it} = 0 \) for the self-employed, or unpaid family

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12 The literature advises that there may be impacts of changes in minimum wages on hours, not jobs. However, the effects on hours may be ambiguous: depends on whether employers have fixed costs of employment (hours of those who remain employed may increase), on how they see hours worked (if as another factor, then employers not only may reduce workers but also hours worked by the workers still employed), whether there are cost of firing workers (then average hours, not employment, may fall). See for instance, Gindling and Terrell (2007). The first version of our proposal submitted to this PEP-PAGE call included the analysis of impacts on hours using a similar specification as equation (1) –as in Gindling in Terrell 2007. But now we follow the advice received in the first comments to our proposal and we proceeded to delete such part (and those of the study of decision models) and focus on wages and (still) employment impacts (through numbers of workers, not hours). However, if we have misinterpreted the suggestion, we can easily revert and also include the analysis of impacts on hours.

13 We aim to study the period 2007-2014 of annual data, provided we obtain the minimum wages set in each of the years 2007-2010. We already have data on minimum wages set for the period 2011-2014, and so we propose to study this period.
worker, which according to Gindling and Terrell (2007) may be a better test of the two-sector competitive model.\[^{14}\]

\[ \ln MW_{it} = \text{log of the real minimum wage that applies to that worker's } i \text{ industry/occupation category in each year } t. \]

\[ X_{it} = \text{individual specific variables (education, experience, gender, and interactions among these variables).} \]

\[ VA_{mt} = \text{Value added by broad industry category.} \]

\[ OCC_{itj} = \text{a dummy for each minimum wage (industry/occupation) category} \]

\[ Y_t = \text{dummy variable for each year.} \]

\[ \mu_{it} = \text{error term.} \]

This is a probit estimation. That is we estimate the determinants of the probability of working or not in the covered sector. For full-time workers (working 40 hours a week or more).

The independent variable of interest is the minimum wage, \(\ln MW_{it}\). The coefficient \(\alpha\) is expected to be negative if there is really a “bite” of the minimum wage in the covered workers. We measure the independent variable of interest as the log of the real minimum wage (deflated by the consumer price index, the CPI varies by regions and cities). The minimum wage varies by industry and occupation in every year under study (in the Official Registry there are labor occupation that we cannot match in the ENEMDU, in this sense we would be losing some information from the variety of the sectorial minimum wages).

The control variables include:

- A vector \(X_{it}\) of individual characteristics such as age, gender, years of education, and quadratic in education.

- Value added (\(VA_{mt}\)) by broad industry category, that should control for events that may affect wages through industry developments.

- Industry/occupation fixed effects (\(OCC_{itj}\)) intents to control for occupation-specific effects and, as stated by Gindling and Terrell (2007) for endogeneity issues given the correlation of wages and minimum wages across different wage or occupation categories (Note: sectorial wages are set at the –more or less– 3-digit industry classification that we can match in our data, but –as stated before, we unfortunately cannot match exactly the variety of occupations (also called structure of categories).

- As it is customary in the literature, it is important to also include year effects (\(Y_t\)), to capture any year-specific events such as aggregate demand or supply shocks. In Gindling and Terrell also justify the inclusion of year effects to capture changes in the design of the household survey, however, to the extent of our knowledge, there has not been any major change in the survey design (of the dataset to be used) in the period proposed (September 2007-June 2014. Note: starting September 2014, ENEMDU changes again but the changes only affect the definition of types of under-employment, an issue not tackled in our proposed study). An error term \(\mu_{it}\)

\[^{14}\text{We shall also, as robustness checks, use alternative definitions of control or uncovered (informal) sector as explained above: (i) self-employed and unpaid family workers plus workers who work in small firms with neither tax nor accounting receipts. (ii) workers (salaried or not) not enrolled in social security.}\]
The coefficient of interest is $\alpha_1$. We test for a negative employment effect of the minimum wage in the covered sector, that is, for whether $\alpha_1 < 0$.

It is worth stressing that, as previously stated, we follow Gindling and Terrell’s identification strategy given that wage setting features in Ecuador are similar to those found in their country of analysis (Costa Rica), that is, we apply different minimum wages set by industry and occupation, and make use of what there seems a consolidation and simplification of a complex wage structure in Ecuador in the last years. In addition, as shown in Table 1, we argue that the minimum wage increases have not been set based solely on inflation rate or in any other labor supply or labor demand condition. Rather, timing of elections seem to play a role in large increases such as those observed in years 2008, 2010, and 2013, when elections and or campaign elections took place in Ecuador. These features not only give variation but also provide with the needed exogeneity in wage setting, needed to avoid endogeneity/simultaneity bias that may exist when comparing changes in a single minimum wage to changes in employment (and wages).

4.- Panel data evidence on minimum wage compliance

4.1 Panel data evidence on compliance

In this section we propose to investigate minimum wage compliance in Ecuador by firm size using panel data at the individual level. As in the data introductory section (see section 1), we propose to study a year of considerable higher minimum wage increase (e.g. 2013). We follow Strobl and
Walsh methodology and link observations on workers in period $t-1$ who were paid less than the new minimum wage set in January\textsuperscript{15} (period $t$) to their wage rates taken a few months after the increase in the minimum wage (e.g., June of 2013), if these workers remained employed (that is, we study two periods, one before and one after the minimum wage increase in question). Then we compare their probability of being paid the minimum wage with that of other workers in the sample to measure the impact of a minimum wage increase on compliance (Strobl and Walsh 2003). Thus we estimate the probability of low-wage workers being paid at least the new minimum wage a period later as:

$$\text{WAGE}_{it} = \alpha_1 \text{MIN}_{it} + \alpha_2 \text{MIN}_{it} \ast \text{Fsize}_{it} + \alpha_3 \text{Fsize}_{it} + \beta \sum_{m=1}^{M} I_{tm} + \sum_{j=1}^{J} \lambda_j \text{O}_{ij} + \sum_{t=1}^{T} Y_t Y_t + \mu_{it}$$

(4a)

Where, as before, $i$ is an index for individual, $m$ is an index for industries, $j$ is an index for occupation (one digit), and $t$ indicates time.

$\text{WAGE}_{it} = 1$ if a worker’s wage rate was at least equal to the new minimum wage in the after-the-new-minimum-wage period studied, and =0, otherwise.

$\text{MIN}_{it} = 1$ if the second period observation of a worker is after the implementation of the minimum wage (e.g. June).

$\text{Fsize}_{it} = 1$ if the firm at which the individual works is large (has more than 10 employees), and =0 otherwise.

$\beta \sum_{m=1}^{M} I_{tm}$ = one-digit industry dummies

$\sum_{j=1}^{J} \lambda_j \text{O}_{ij}$ = one-digit occupation dummies

$\sum_{t=1}^{T} Y_t Y_t$ = time dummies

As in previous regressions, we also include regional dummies. Strobl and Walsh note that the interaction term between the dummy for compliance to the new minimum wage (MIN) and the dummy for size of a firm aims to capture differences in compliance across different firm size: in a developing country it is expected that large firms would comply to minimum wage, but small firms (or, informal small firms) might not.

The above is a probit model, where coefficients are reported as marginal effects, for male and female low-wage workers. Given our interest in the impacts on the youth, we analyze the age term which will tell us whether young workers would be pushed up or not to the new minimum wage a period later.

\textsuperscript{15}\text{Recall that (sectorial) minimum wages are announced and set by law through its publication in the Official Registry in early January of each year.}
In another specification, Strobl and Walsh introduce the initial wage as an additional term, to account for potential measurement error in the wage variable (and hence, in the measure of compliance).

An issue with Strobl and Walsh’s work, as pointed by these authors, is that it assumes that the workers remain employed when a minimum wage increases, which precisely for low-wage workers might not be the case.

In summary, for compliance, a key variable of interest is the interaction term between the firm size and the minimum wage dummy (coefficient $\alpha_2$) which should allow us to say if compliance (an increase in the likelihood of a low-wage worker experiencing an increase in his/her wage rate to at least the new minimum wage) happens, and whether it happens in large and/or small firms. In addition, it is important to study these effects distinguishing by female and male workers, and by age group, because (among other situations) as pointed by Strobl and Walsh, firms may avoid the higher cost of an increase in the minimum wage by firing some of their low-wage workers (women, the youth), decreasing their share in total employment. By doing so, these firms overstate compliance in the aggregate. To disentangle the this employment effect it is important to study what happens with job loss when a minimum wage increase takes place, but by different types of firms and workers.

4.2 Compliance and panel data evidence on jobs loss

To study whether firms recur to firing or laying off when a minimum wage increases we again follow Strobl and Walsh (who in turn follow Currie and Fallick’s approach) and estimate the probability of jobs loss after the January at period $t$ (say 2013) minimum wage increase in Ecuador using the panel data set in our previous section. The equation and the variables of interest are now:

$$
\text{JOBLOSS}_{it} = \alpha_1 \text{BOUND}_{it} + \alpha_2 \text{BOUND}_{it} \times \text{Fsize}_{it} + \alpha_3 \text{Fsize}_{it} + X_{it}' \beta \\
+ \sum_{m=1}^{M} I_{tm} + \sum_{j=1}^{J} \lambda_j O_{itj} + \sum_{t=1}^{T} \gamma_t Y_t + \mu_{it}
$$

(4b)

where, indices are as before, and the vectors $X, I, O, Y$ correspond to individual characteristics, industries, occupation, and year, respectively.

$\text{JOBLOSS}_{it} = 1$ if the worker lost his/her job, either due to layoff or being fired after the minimum wage increase, and $=0$, otherwise.

$\text{BOUND}_{it} = 1$ if the individual is a low-wage worker (for the first observation or the observations before the minimum wage increase under study) and his/her second observations correspond to after the increase in the minimum wage, which—as explained by Strobl and Walsh—tries to
control for the variation in the probability of job loss for those directly affected by the minimum wage.  

An alternative specification in Strobl and Walsh (who follow Currie and Fallick 1994), includes a WAGEGAP variable instead of BOUND. This variable seeks to capture the differential impact on low-wage workers with different wage rates, that is, “the farther the worker’s wage is from the minimum level, the more costly it will be for the employer to comply and the more likely the employer is to lay off or fire this worker as compared with other low-wage workers whose wage may be relatively higher, ceteris paribus.” (Strobl and Walsh 2003, p. 445). The WAGEGAP variable is equal to the absolute value of the difference between a low-wage worker’s initial wage and the new minimum wage evaluated at constant prices, whenever BOUND equals one, and zero otherwise. An additional term is the interaction between the WAGE GAP and the firm size dummy variable that—as in the interaction term of the previous specification—allows for different impacts by firm size. Again we also control for regional effects.

4. Data requirements and sources
This is a critical part of the proposal. The key issue is to explain the reason for the use of the particular data. You must establish that they are ideal for the question you wish to address. Please consult the “Guide for designing a research project proposals” for more detail.

We propose to use data from the national survey on employment, unemployment and underemployment (ENEMDU) for the period 2007-2014. We propose this period for several reasons. First, the current government started its mandate and its policy of minimum wages increases in 2008, so we consider 2007 (or later) the initial year of our proposed study. Although minimum wage increases happened in previous years, those years have several issues that preclude us from using them. 2000-2003 correspond to a period of considerably high increases in minimum wages, because it was a period of recovery from the deep economic-financial-currency-debt crisis of 1999 that ended with the adoption of the US dollar the currency of Ecuador in January 2000. A protracted period of price adjustments (convergence) followed this adoption, with higher than expected inflation rates for a dollarized economy. Thus the analysis of minimum wage impacts during these initial years of dollarization is complicated by these national developments. More importantly, from the data point of view, the definition of employment changed in 2007 (as captured in the questionnaire of the proposed survey data to be used), marring comparability of employment data for previous year.

The data proposed for this study, ENEMDU, is a national survey conducted by the National Institute of Statistics and Census of Ecuador (INEC). This survey is representative at the national, regional, province, and large cities levels. It is conducted every quarter (March, June, September, and December) of each year, and the December and June issues have data for both urban and rural areas (except for June 2009 that only has urban data). Thus depending on which data we use we can do the

---

16 As in Strobl and Walsh’s study of Trinidad and Tobago, there are some issues with the bound variable, because we cannot capture workers that may have lost their jobs after the minimum wage increase and regained employment before the second observation (unless there was a change in occupation or industry).
analysis for urban only or for urban and rural areas. ENEMDU is a 2x2x2 panel data, where the same households appear in two consecutive quarters, then leave for two quarters, to reappear again for another two consecutive quarters.

According to INEC, ENEMDU is stratified, probabilistic (in three stages), proportional to sample size. His confidence level is 95% and its margin of error is 0.003. ENEMDU is the survey data used to produce the official statistics on employment in Ecuador; it has also been used in research relevant to employment, and related issues (by our research team; and, of course, by others).

This survey data contains variables at the individual level for employment, wages, non-wage earnings, education, gender, cash transfers, and others of interest. The independent variable of interest, minimum wages, will be inserted every year, for each individual, according to the industry and occupation level matching these with the information available from the Official Registry (sectorial minimum wage disaggregation has more detail in the Official Registry than those contained in ENEMDU, so some detailed information on minimum wages will be lost).

In the methodology we have explained the data to be used and the panel data to be constructed when using a panel approach. The sample design of this survey allows us to match same individuals across two consecutive quarters; and, across two consecutive years for some years. That is, ENEMDU allows short panels to be constructed. Table 3 below shows the rotation scheme of ENEMDU for years 2007-2014.

Table 3.- ENEMDU: Panel structure
Periods of panel data highlighted or enclosed in squares

<table>
<thead>
<tr>
<th></th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sep</td>
<td>Dec</td>
<td>Sep</td>
<td>Dec</td>
<td>Sep</td>
<td>Dec</td>
<td>Sep</td>
<td>Dec</td>
</tr>
<tr>
<td>170</td>
<td>190</td>
<td>210</td>
<td>230</td>
<td>q0</td>
<td>s0</td>
<td>u0</td>
<td>w0</td>
<td>s2</td>
</tr>
<tr>
<td>180</td>
<td>200</td>
<td>220</td>
<td>240</td>
<td>r0</td>
<td>t0</td>
<td>v0</td>
<td>x0</td>
<td>t2</td>
</tr>
<tr>
<td>190</td>
<td>210</td>
<td>230</td>
<td>250</td>
<td>s0</td>
<td>u0</td>
<td>w0</td>
<td>y0</td>
<td>y0</td>
</tr>
<tr>
<td>200</td>
<td>220</td>
<td>240</td>
<td>260</td>
<td>t0</td>
<td>v0</td>
<td>x0</td>
<td>z0</td>
<td>u2</td>
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<td></td>
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<td>Dec</td>
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<td>Dec</td>
</tr>
<tr>
<td>2007</td>
<td>2008</td>
<td>2009</td>
<td>2010</td>
<td>2011</td>
<td>2012</td>
<td>2013</td>
<td>2014</td>
<td></td>
</tr>
</tbody>
</table>

Source: Own tabulations using data from ENEMDU, 2007-2014.
Note: ENEMDU is the survey of employment, unemployment, and underemployment of Ecuador. This survey is collected and processed by INEC (National Institute of Statistics and Census).

5. Policy influence plan (or research communication strategy)

- Referring to the policy context described in section 2.1., identify potential users of your research findings, including policymakers and other key stakeholders. Provide a list of institutions and, whenever possible, specific individuals to be targeted for effective policy influence. Please also indicate whether you have already made contacts within the institutions.

- How, in the elaboration and execution of your project (from design to dissemination), will you consult/communicate with these users to both gather their inputs and keep them informed of your
You can refer to PEP’s research communications strategy and guidance to have a better idea of what is expected in terms of activities for policy outreach and dissemination.

<table>
<thead>
<tr>
<th>Institution</th>
<th>Contact</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ministry of Labor</td>
<td>Done, by letter (see above)—as customary for these institutions.</td>
<td>Carlos M. Carrasco (Minister)</td>
</tr>
<tr>
<td>CONADES (Institution in charge of determining the basic unified minimum wage)</td>
<td>To be done. Done, by letter, for another research project already finished.</td>
<td>Javier Estupiñán (President) Ximena Cobos (Secretary)</td>
</tr>
<tr>
<td>ILO (International Labor Organization), Ecuador</td>
<td>To be done. Done, by letter, for another research project already finished.</td>
<td>Bladimir Chicaiza</td>
</tr>
<tr>
<td>IESS (Social Security Institute of Ecuador)</td>
<td>Done, by letter, for another research project already finished.</td>
<td>José Martínez Dobronsky (Director General)</td>
</tr>
<tr>
<td>CEMDES (Center for Enterprise Development)</td>
<td>To be done for this proposal in particular. Our school works with CEMDES in the organization of monthly talks conducted in our school premises.</td>
<td>Inés Manzano Díaz (President)</td>
</tr>
<tr>
<td>ATDHR (Domestic Workers Association)</td>
<td>Done, by phone, and in person for another research project already finished.</td>
<td>Maritza Zambrano (President)</td>
</tr>
</tbody>
</table>

We have identified policymakers and other stakeholders potentially interested in reading the results from the proposed research; some of which we have already contacted, either because of this proposal or because of another research in the past (see list above, and lists of related projects undertaken by team members). Given that Ecuador has the policy of annual increases in minimum wages and, to the best of our knowledge, impacts of this policy on employment and distribution of wages and non-wage earnings have yet to be evaluated (at the individual and household levels, and by groups such as the youth and women), we believe that not only policymakers, but also firms, workers, and regional labor organizations will be interested in the future findings. From the results, policymakers may learn that individuals to whom the minimum wage policy (of annual increases, -well- above the inflation rate) is supposed to help, may actually be the ones being most hurt in terms of higher unemployment or informality. Policymakers and other stakeholders may also learn about distributional impacts (important for the reasons given in the methodology section). Policymakers should care about employment and wage effects as the government has the goal of providing Ecuadorians with a decent wage (“salario digno”), and recognizes that a decent employment is a basic right. We hope that the evidence shall be used for the design of future minimum wage policies -in particular considering that the government is
currently debating reforms to the Labor Code.

For our research to have an effective policy impact we will follow a design and dissemination strategy that *first* identifies a decision policy maker and key stakeholders involved in labor market and minimum wage issues and *then* we will organize activities geared towards generating participation and reactions from these actors regarding labor legislation and minimum wage impacts.

At the **design** stage we have contacted key policymakers (we contacted the Ministry of Labor – See letter above, see also list of suggested stakeholders above) and CEMDES Director (CEMDES President has yet to be contacted) to gather their input concerning minimum wages determination in Ecuador.

To translate research into policy we will use a **dissemination strategy** based on three strategies: (1) Organization and inclusion of target population (this step is also part of the design stage), (2) Education and awareness, and (3) the media. Each of these dissemination strategies would comprise of several activities. Box 1 shows a preliminary proposed budget for these activities.

1. - The **organization and inclusion of target population strategy** proposes the following events: a focus group discussion and a brown-bag seminar.

   **Focus Group Discussions (FGDs).** - The target audience of the FGDs is policy makers. This is the first event in the design strategy, and also for the dissemination strategy. The FGDs will have between 6 to 8 participants (See Start and Hovlan 2004). These policy makers should be carefully selected to become the *champions* (for instance from the Ministry of Labor, we expect the Minister to appoint a person with whom we will be in contact concerning this proposal), who will pass on the evidence to other policy makers (for instance, the Minister of Labor himself) and support the credibility of the research (Court and Young, 2003). The expected results of the FGDs is to present the main issues of the proposal, gather a range of opinions and views on the policy issues of minimum wages and its implementation, and provide insight into different policy perspectives on the research at hand of those involved in the policy process, "*thus enabling the process to be managed more smoothly.*" (Start and Hovland 2004, p17). This activity should be the beginning of a two-way dialogue between researchers and policy-makers on labor market issues related to minimum wages in Ecuador.

   **Brown-bag seminar (BBS).** -The target audience of the BBS is the faculty of our department. This seminar would be the second event in the dissemination strategy. The expected result of this event is a discussion about the research methodology and early findings of the study.

2. - The **education and awareness strategy** proposes the following events: a forum and a policy brief.

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17 This design and dissemination strategy is based on previous experiences and proposals undertaken by the Project Leader. We are very open to strengthen this policy influence plan with the suggestions of PEP-PAGE.
- **Forum.** - The target audience of the one-day forum are policy makers, professors, students, union leaders, and other stakeholders. The forum on labor market developments in Latin America is the third event on the timeline of the dissemination strategy. The speakers would include policy makers and academics from the region. Our school has organized similar events of policy discussion in the past (for instance, in May 2005 on FTAs; in November 2009 on poverty and trade; in April 2012 an international discussion on trade and poverty; in November 2014 a forum to discuss results of a research on the impacts of maids of the mandated social security enrollment –research funded by GDN; and, a monthly breakfast with CEMDES, just to name a few). The expected result of this forum is to raise public awareness about the relationship between labor laws, labor markets outcomes and minimum wage policies in Ecuador.

- **Policy brief.** - The target audience of the policy brief are decision policy makers (e.g. Ministry of Labor). The writing and distribution of a policy brief will be one of the last events in the timeline of the dissemination strategy. The policy brief will be printed and sent to a mailing list of key stakeholders as well as posted on our school website. The expected result of the policy brief is to provide policy makers with both a tool to evaluate policy recommendations regarding labor markets and minimum wages impacts (on low-wage individuals), and a call to action on this issue.

3.- The *media* strategy proposes two types of activities: interviews and an article.

- **Interviews.** - The target audience of the interviews is the general public. Interviews should happen through the development of the study. The expected result is to draw/keep attention on the research topic in the public, and amongst policy makers and other key stakeholders. We will draw support from the media department in our school –as we have done in previous studies and events.

- **Article.** - The target audience for the article (to be published in a local business magazine) are key stakeholders and the general public. Again, this activity may take place at various stages in the dissemination strategy. One article will be tailored to business persons and union leaders, and will seek to generate debate on the issues of minimum wages.

On the academic front, besides publishing the research as a PEP working paper, we expect to discuss it in academic conferences. We plan to submit the paper to a suitable academic journal.
**Box 1.- Preliminary budget for the research-to-policy and dissemination strategy**

1. **Proposed event: Policy brief**
   - Target audience: Policy makers
   - Activity/item
     - Printing of 200 policy briefs: US$ 510
     - Mailing and distribution of policy briefs: US$ 100
     - Miscellaneous: US$ 50
   - Total: US$ 660

2. **Proposed event: Focus Group Discussion (6-8 people)**
   - Target audience: Policy makers
   - Activity/item
     - 5 roundtrip tickets Quito-GYE-Quito (US$ 130 each): US$ 650
     - Lunch for participants: US$ 100
     - Miscellaneous: US$ 50
   - Total: US$ 800

3. **Proposed event: One-day forum (5-6 speakers, up to 80 participants)**
   - Target audience: Policy makers, professors, students, business and union leaders, and other stakeholders
   - Activity/item
     - 2 roundtrip tickets, and lodging (US or a Latin American country - Guayaquil, Ecuador): US$ 2500
     - 5 roundtrip tickets Quito-Guayaquil-Quito: US$ 650
     - Lunch for speakers and selected policy makers invited: US$ 300
     - Miscellaneous: US$ 50
   - Total: US$ 3500

**Other events for the Dissemination Strategy. No funding needed**

- **4.- Brown-bag seminar. Professors.**
  - Activity & Target audience: US$ 0
- **5.- Interviews. Key stakeholders and general public.**
  - Activity & Target audience: US$ 0
- **6.- Article in magazine. Business persons and labor leaders.**
  - Activity & Target audience: US$ 0

**Total Budget for research to policy and dissemination strategy**

- **1.- Focus group**: US$ 800
- **2.- One-day seminar**: US$ 3500
- **3.- Policy brief**: US$ 660
- **4.- Others (brown-bag seminar, interviews, article)**: US$ 0

**Total Budget**: US$ 4960

Note: All proposed events should be held in our school facilities and organized in collaboration with the staff of our school.

We know that for research to have a policy impact it may take time. We also know that some authors suggest that it may be “rare that a single piece of research leads to policy change” (Court and Young, 2003, p. 19), thus we see the proposed study as the continuation of our research agenda related to the analysis of economic impacts of policy changes using firm-level data (Wong 2007, 2009), or household data (Wong and Kulmer 2012; Wong and Arguello 2010), and as the continuation of a recently open line of research on labor market issues (Wong 2015, 2014). We believe that focusing on labor market legislation and minimum wage issues should allow us to give relevant policy recommendations that contribute to growth in the economy, and will do so in a suitable manner: through meetings with policy makers and through a network of academic researchers.
6. List of team members

Indicating their age, sex, as well as relevant/prior training and experience in the issues and research techniques involved (start with team/project leader).

Note that PEP favors gender-balanced teams, composed of one senior (or experienced) researcher supervising a group of junior researchers, including at least 50% female researchers, all contributing substantively to the research project. PEP also seeks gender balance in team leaders and thus positively encourages female-led research teams. (Each listed member must post an up-to-date CV in their profile on the PEP website – refer to “How to submit a proposal”)

<table>
<thead>
<tr>
<th>Name</th>
<th>Age</th>
<th>Sex (M,F)</th>
<th>Training and experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sara A. Wong</td>
<td></td>
<td>F</td>
<td>Ph. D. in Economics. Experience in building databases, econometric models, Stata,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>organization and coordination of workshops and meetings.</td>
</tr>
<tr>
<td>Juan José Salcedo</td>
<td>25</td>
<td>M</td>
<td>B.A. in Economics. Experience in building databases, econometric models, Stata.</td>
</tr>
<tr>
<td>Yael Negrete</td>
<td>22</td>
<td>F</td>
<td>Undergraduate students of Economics, at ESPOL. Knowledge of Stata.</td>
</tr>
</tbody>
</table>

7. Expected capacity building

Description of the research capacities that team members (and potentially their affiliated institutions) are expected to build through their participation in this project.

This is an important aspect in the evaluation of proposals and should be presented in some detail. What techniques, literature, theories, tools, etc. will the team and their institutions learn (acquire in practice) or deepen their knowledge of? How will these skills help team members in their career development? Also indicate which specific tasks each team member would carry out in executing the project.

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Sara A. Wong, ESPAE-ESPOL:
-I would like to deepen my knowledge of quasi-experiments and the so-called natural experiments to study impacts on labor outcomes and wage distribution of minimum wage policies. I have study this issue as a by-product of another research that focused on a mandatory social security enrollment for domestic workers. The literature on minimum wages is abundant for developed countries, but not so much for developing countries, despite the fact that, governments in developing countries rely on minimum wages to improve wages and earnings of workers.

-The publications that we expect to achieve through the development of the proposed research should help me advance in my career as a professor. I also want to contribute to the policy discussion in my country, as I believe professors can provide valuable inputs to policymakers through their findings in sound research studies.
This research proposal should also help strengthen the case for building/having a Group dedicated to the analysis of public policies in my school, an initiative that we are starting to build (see for instance our policy brief publications, available at http://www.espae.espol.edu.ec/pol%C3%ADticas-p%C3%BAblicas/ver-categoria). In fact, our school, having recently achieved the AACSB (The Association to advance Collegiate Schools of Business) accreditation, values policy recommendations derived from faculty studies and is striving to build a metric to highlight policy impacts of our studies.

Juan José Salcedo

Through this research I would like to:
- Gain a good grasp about assessment of real labor market implications of the theoretical framework of minimum wages.
- Develop insights of the reactions of minimum wage earners in Ecuador and the characteristics of the Ecuadorian labor market and its developments.

These skills will help me
- Develop new insights on the capability of the economics model to adjust itself to the observed real world reaction of minimum wage earners.
- Strengthen the data cleaning skills for future projects and papers.
- Position our university and our research teams as leading institutions in microeconomic analysis and modeling.

Yael Negrete, Economics Department-ESPOL:

With this project:
- I would gain experience in the management of data bases using econometrics knowledge that I also want to acquire.
- I would also like to develop my analytical skills through the understanding and application of theories to be used in this research project.
- This study will help me understand in a better way the distribution of wages in my country which in turn will help me understand inequalities issues.

As per career development:
- I will have the opportunities to meet policy makers and to participate in conferences, all of which should contribute to the advance of my academic training in the area of economics policies.
- Because I want to be a researcher it is a great opportunity for me to be part of research project.
<table>
<thead>
<tr>
<th>Name</th>
<th>Task/contributions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sara A. Wong</td>
<td>Work on the econometric design to implement the proposed methodology research. Draft the paper. Participate in all policy design and dissemination activities. Represent the team in academic conferences and in talks with policy makers.</td>
</tr>
<tr>
<td>Juan José Salcedo</td>
<td>Do data cleaning and compilation of the employment surveys of Ecuador (ENEMDU) and other related data bases. Run econometric models, hypothesis test, and construct descriptive statistics. Construct tables and graphs to illustrate findings. Represent the team in academic conferences. Process information gathered and perform the homologation of the minimum wage databases. Help draft policy brief. Apply basic econometric knowledge.</td>
</tr>
<tr>
<td>Yael Negrete</td>
<td>Collect information required for the research (qualitative and quantitative data). Contact policymakers to collect policy recommendations that strengthen the results of the research (for example: through interviews). Assist in the organization of communication activities and dissemination of research results; in particular, will be in charge of organizing focus group. Represent the team in talks with policy makers. Contribute to the organization of events related to dissemination strategy such as policy forum and focus group.</td>
</tr>
</tbody>
</table>

8. **List of past, current or pending projects in related areas involving team members**

Name of funding institution, title of project, list of team members involved

<table>
<thead>
<tr>
<th>Name of funding institution</th>
<th>Title of project</th>
<th>Team members involved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global Development Network (GDN)</td>
<td>Labor Market Effects of Mandatory Benefit Regulations and Social Security Enrollment for Maids in Ecuador: -Survey work -Econometric work</td>
<td>Sara A. Wong Juan José Salcedo (Others, but not involved in the current PEP-PAGE proposal)</td>
</tr>
<tr>
<td>Centro Latinoamericano para el Desarrollo Rural (RIMISP)</td>
<td>Pobreza y dinámicas territoriales en Ecuador</td>
<td>Sara A. Wong (Others, but not involved in the current PEP-PAGE proposal)</td>
</tr>
<tr>
<td>Escuela de Postgrado en Administración de Empresas (ESPAE), the Graduate School of Management at ESPOL</td>
<td>Análisis Exploratorio de la Pobreza Multidimensional en Ecuador</td>
<td>Sara A. Wong Juan José Salcedo</td>
</tr>
</tbody>
</table>
9. Describe any ethical, social, gender or environmental issues or risks that should be noted in relation to your proposed research project.

We do not envision any ethical, social, gender or environmental issues or risks in relation to our proposed research project. That is, as per social and gender issues, only the ones related to the purpose or our research analysis (as noted above about the impact of minimum wages that are expected to be stronger for low skill-low wage workers).

References and plagiarism:
Applicants should also be very careful to avoid any appearance of plagiarism. Any text that is borrowed from another source should be carefully contained between quotation marks with a reference to the source (including page number) immediately following the quotation. It is essential that we be able to distinguish what you have written yourself from what you have borrowed from elsewhere.
Note also that copying large extracts (such as several paragraphs) from other texts is not a good practice, and is usually unacceptable. For a fuller description of plagiarism, please refer, for example, to the following website:

- http://writing.yalecollege.yale.edu/advice-students/using-sources/understanding-and-avoiding-plagiarism

PEP will be using a software program to detect cases of plagiarism.

REFERENCES


