EMPLOYMENT VULNERABILITY, EARNINGS AND SUBJECTIVE WELL-BEING IN KYRGYZSTAN

RESEARCH PROPOSAL

Presented to

Partnership for Economic Policy (PEP)

By

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&

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KYRGYZSTAN

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1.1 Abstract

In low income countries under poor economic conditions and limited employment opportunities individuals face unstable remuneration, underemployment, informal employment, part time jobs, and look for additional employment. Therefore, the fact of being employed does not guarantee the long term job stability and security. This situation can be described with the employment vulnerability concept. Employment vulnerability may cause differences in earnings and different subjective perception of individuals about well-being. The main objective of this research proposal is to investigate characteristics of the employment vulnerability in Kyrgyzstan and its impact on earnings and subjective well-being with special reference to youth and women. According to the NSCKR (2016) data in Kyrgyzstan only 46.0 per cent of wage employees have permanent job, while remaining share has contracts for limited period or work without any contracts. In the context of Kyrgyzstan understanding employment vulnerability and its impact is important for undertaking government policies in labour market.

This research will be based on the longitudinal data for 2010-2013 and 2016 from the Life in Kyrgyzstan survey that allows identification of employment vulnerability effects over time. Because of the endogeneity of employment vulnerability Fixed Effects Instrumental Variable approach will be applied. Moreover, impact of employment vulnerability on earnings may vary depending on the position in earnings distribution. In order to take into consideration these possible effects we will also use Quantile Regression (QR) approach within the Fixed Effects. For this we follow Koenker (2004) and Canay (2011) as an extension of the standard QR model to Fixed Effects for longitudinal data. In addition to the Fixed Effect IV method, we will adopt repeated cross sectional analysis. Some parts of potential instrumental variables are time-invariant and can be used in cross-sectional model specification, which is also appropriate for dealing with endogeneity issue. At the same time these repeated cross section models will provide us with a robustness analysis for our main panel data estimations.

1.2 Main research questions and contributions

Most of the labour market analysis in the context of youth and women empowerment focuses on understanding reduction of unemployment and increasing labour supply. However, in low income countries employment arrangements vary by its stability, security and contract types. Under poor economic conditions and limited employment opportunities individuals may face unstable remuneration, underemployment, informal employment, part time jobs, and look for additional employment. Therefore, the fact of being employed does not guarantee the long term job stability and security. According to the ILO (2017) number of workers in vulnerable forms of employment remains pervasive and projected to grow
globally by 11 million per year. Outcome of such employment conditions has direct implications for poverty and vulnerability of households. Moreover, employment vulnerability is reflected in differences of earnings and subjective well-being of individuals.

Kyrgyzstan is landlocked and one of the poorest countries in the Europe and Central Asia region with a GNI per capita of US$1,250 in 2014 (Atlas methodology). Economic transition since the independence in 1991 lead to structural changes in the economy that did not generate adequate job opportunities for growing labour supply (GIZ, 2013).

According to official statistics general unemployment rate is not too high - in 2015 accounted for 7.6 per cent (NSCKR, 2016). However analytical reports note that employment in Kyrgyzstan corresponds with poverty. In rural areas higher poverty rate and lower intensity of unemployment is observed, which is explained by the seasonal employment and high levels of underemployment (GIZ, 2016; World Bank, 2007). Only 46.0 per cent of wage employees have permanent job, while remaining share has contracts for limited period or work without any contracts. ILO (2016) states that the share of underutilized labour potential accounts for 38.7 per cent of the youth population. Moreover, 28 per cent of the total employed labour force work less than 35 hours per week. This rate is higher for women - 37 per cent, and youth, - 43.1 per cent. Official statistics indicate that in Kyrgyzstan more than 70 per cent of the active labour force is employed informally (NSCKR, 2016). Therefore, although in the labour market of Kyrgyzstan job places are generated, vulnerability remains as important issue.

Employment vulnerability is multidimensional concept and can be defined as the risk of working under inadequate conditions (Bazillier et al., 2016). Current empirical literature is focused on different aspects of employment vulnerability and analyse them in the context of developed countries (Maloney, 2004; Böckeman and Ilmakunnas, 2006; Bewley and Forth, 2010; Botelho and Ponczek, 2011; Nguyen et al., 2013; Bargain and Kwenda, 2014; Nordman et al., 2016). Only a few paper analyse employment vulnerability in a developing country context (Bocquire et al., 2010; Ndamsa et al., 2013). Moreover, the specific focus on women and youth within the employment vulnerability is lacking in previous studies.

Given the importance of this topic, the main objective of this research proposal is to investigate characteristics of the employment vulnerability in Kyrgyzstan and its impact on earnings and subjective well-being with special reference to youth and women.

Within this main objective, following research questions are investigated:

1. What are the basic factors affecting employment vulnerability?
2. What is the effect of employment vulnerability on earnings? Is this effect different for youth and women?
3. What is the impact of employment vulnerability on subjective well-being? Is this effect different for youth and women?

Review of the corresponding literature in this field indicates that analysis of employment vulnerability in developing countries is very limited and there are no special focus on women and youth. Therefore, the main contribution of this study to this scarce literature is that it extends analysis of the effect of employment vulnerability in a developing country context
with its specific focus on women and youth.

Along with the main contributions, several other features of this study can be summarized as following:

1. To our best knowledge this is the first study on employment vulnerability in the specific case of Kyrgyzstan.

2. In this research we measure employment vulnerability through multidimensional approach. This allows assessment of not only particular part of labour market, such as informality or unemployment only, but also discussion of labor market fragility within the broader concept including employment stability, security etc.

3. We will use longitudinal data for 2010-2013 and 2016 from the household survey data, that allows identification of employment vulnerability effects over time. Although, previous empirical studies on employment vulnerability mostly used cross-sectional data.

4. This research projects aims to estimate impact of employment vulnerability not only on earnings, but also on subjective well-being of individuals. This part of the study extends earlier empirical studies on employment vulnerability to subjective well-being.
## SECTION II – CAPACITY BUILDING

### 2.1. Team composition and experience

#### Team leader

<table>
<thead>
<tr>
<th>Name</th>
<th>Age</th>
<th>Sex (M, F)</th>
<th>Highest degree/diploma</th>
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<tr>
<td>Kamalbek Karymshakov</td>
<td>35</td>
<td>M</td>
<td>PhD</td>
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**Work and Research Experience:**
- Assistant Professor, Kyrgyz-Turkish Manas University, Finance and Banking Department (Bishkek, Kyrgyz Republic)
- Post-doctoral Research Fellow, Free University of Berlin (Germany)
- Research Fellow (ORASAM, Bishkek, Kyrgyz Republic)
- Research experience for 10 years
  - Household welfare
  - Labor economics
  - Migration and remittances
  - Social accounting matrix
  - Economic integration issues

**Training**
- GAUSS programming
- Microeconometrics with STATA

**Expected capacity building**

As the lead researcher Kamalbek already has background in empirical analysis and policy impact experience. During the previous PEP experience he acquired good knowledge on the particular microeconometrics technique for labour supply analysis. Due to previous PEP experience he became an expert on migration, remittances and labour outcomes in Kyrgyzstan and started for intensive academic works on migration and labour in Kyrgyzstan.

This proposed project focuses on the other aspect of employment: on employment vulnerability and its impact on earnings and well-being of youth and women in Kyrgyzstan. Microeconometric techniques applied to the panel data structure will be the main expected capacity building for him. Moreover, acquired knowledge and participation in activities within this project, will be important contribution to his career development through increasing academic capacity and policy expertise skills on labour market and education policy.

**Contribution to project**

As team leader of this project Kamalbek Karymshakov has large experience in labour market research and consulting government bodies and international organizations in various social and economic policy issues in Kyrgyzstan. His consulting experience on a broad scope of social and economic issues in Kyrgyzstan will contribute to policy engagement activities with this research output.

He will be responsible for overall coordination of team works, guidance on econometric estimation techniques, drafting policy implications part of the research paper. He will also lead works related with the consultation meetings and discussions of research results. He will prepare the draft of the research paper.
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<tr>
<td>Burulcha Sulaimanova</td>
<td>30</td>
<td>F</td>
<td>PhD</td>
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**Training and experience**

- **Work and Research Experience:**
  - Research experience for 7 years
  - Remittances and Economic Growth
  - Migration in Central Asia

- **Training**
  - Applied Econometrics
  - Microeconometrics
  - STATA, E VIEWS and SPSS applications

**Expected capacity building**

As researcher of the proposed project team, she is expected to benefit from the capacity building both in terms of acquiring new skills for estimation and career development. Burulcha has already had an experience on working with large data analysis on STATA dealing with selection and endogeneity issues in the last PEP research project. However, proposed methods of estimation in this project are new for her and her active engagement in the research activities will provide with new skills in labour market analysis, particularly in panel data analysis with survey data.

It is important to mention that in Kyrgyzstan only a few academicians applying panel data analysis in their researches, and acquiring econometric skills on panel data analysis with both dealing with selectivity and endogeneity issues will make a big contribution in her academic activity.

Together with senior researcher of the team, with Kamalbek, she will be engaged into the scientific and other meetings at national level with the presentation of research results, which will provide with good opportunity for career development as well.

**Contribution to project**

Burulcha Sulaimanova is the person or team member who has the required skills and capacities to replace the team leader, in case if the team leader is not able to complete the project.

Burulcha will work on methodology and estimation part of the project. Thus she will prepare the modeling techniques and write up discussion part of the research. Also she will be involved for communication and organization of works related with discussions and dissemination activities. In particularly, she will be responsible for presenting research results at the scientific and policy oriented meetings at national level for policy impact purposes.
### Team member #3

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<th>Name</th>
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<tr>
<td>Nurjan Shabieva</td>
<td>28</td>
<td>F</td>
<td>MSc</td>
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</table>

**Training and experience**

PhD student  
*Work and Research Experience:*
- Accountant and auditor in banks of Kyrgyzstan  
- Research experience for 2 years  
*Training*
- Microeconometrics  
- Statistical Analysis with SPSS

**Expected capacity building**

She is the junior researcher in the team and her particular interest is in the deepening knowledge of application microeconometric techniques. In our case, this is the data preparation for the panel modelling techniques, learning the advanced level STATA programming, getting acquaintance and learning dealing with selectivity bias and endogeneity issues both in panel and cross-section analysis. This proposed topic is new for her research interest. However, being the new topic, it may substantially contribute to her career development.

**Contribution to project**

Nurjan will be responsible for the review of theoretical bases of the paper and the dataset preparation and preliminary analysis. She will assist to Burulcha Sulaimanova in estimation and writing up discussion part.

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### Team member #4

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<tbody>
<tr>
<td>Jainagul Kydyralieva</td>
<td>29</td>
<td>F</td>
<td>MSc</td>
</tr>
</tbody>
</table>

**Training and experience**

PhD student  
*Work and Research Experience:*
- Research experience for 2 years  
*Training*
- Microeconometrics  
- Statistical Analysis with SPSS

**Expected capacity building**

She is expected to benefit from every stages of the project implementation. Along with this, she will have opportunity to gain and improve both her academic writing and econometric modelling skills.

**Contribution to project**

Jainagul will work with Burulcha Sulaimanova at preparing general overview of employment in Kyrgyzstan. Particularly, she will be responsible in analysis of the recent tendencies of employment of youth and women in Kyrgyzstan. Also she will be involved in communication activities and logistical works for policy dissemination activities.
2.2. List of past, current or pending (non-PEP) projects in related areas involving team members, including resulting publications (if any)

<table>
<thead>
<tr>
<th>Name of funding institutions</th>
<th>Title of projects and related publications (link)</th>
<th>Team member(s) involved</th>
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<tbody>
<tr>
<td>UNU-WIDER and University of Namur</td>
<td>Migration impact on women labour supply and time-use patterns: Evidence from Kyrgyzstan</td>
<td>Kamalbek Karymshakov Burulcha Sulaimanova</td>
</tr>
<tr>
<td>Ministry of Education and Science of the Kyrgyz Republic</td>
<td>Education Mismatch and Employment Outcomes of Youth in Kyrgyzstan</td>
<td>Kamalbek Karymshakov Burulcha Sulaimanova</td>
</tr>
</tbody>
</table>
|                               | The research outputs were presented at international level conferences in Kyrgyzstan.  
|                               | Papers published:  
| Foundation for Progressive Initiatives | Accession of Kyrgyz Republic to Customs Union: Advantages and Disadvantages (includes analysis of impact on households welfare) | Kamalbek Karymshakov |
| Friedrich-Ebert Stiftung (Bishkek) | The Role and Perception of Turkey in Central Asia  
The Role and Perception of Turkey in Kyrgyzstan. Friedrich Ebert Stiftung, Bishkek, 2012 | Kamalbek Karymshakov |
| National Institute of Strategic Studies of Kyrgyz Republic (NISS KR) | Impact of Economic Crisis in Russia on Migration from Kyrgyzstan  
Journal "Orientir", the National Institute for Strategic Studies of the Kyrgyz Republic, №8 (39) 2015 | Kamalbek Karymshakov Burulcha Sulaimanova |

2.3. List of past or current PEP-supported projects involving team members, including resulting publications

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<th>Title of project and related external (non-PEP) publications, if any</th>
<th>Team member(s) involved</th>
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</table>
| PMMA-12594   | Remittances Impact on Youth Labour Supply: Evidence from Kyrgyzstan  
3.1 Literature review

Provision with job places and decrease of unemployment is not the only goal for the government policy in labour market. Macroeconomic instability and weak labour market institutions may result in different forms of employment fragility, which may contain atypical job contracts, increase in job turnover, instable and insecure jobs. Working under these conditions pose economic and psychological pressure over individuals. These trends in multiple aspect of labour market can be described within the “employment vulnerability” concept.

Vulnerability can be defined as “how hard it is for individuals to manage the risks or cope with the losses and costs associated with the occurrence of risky events or situations” (Bocquier et al., 2010, p. 1297). In other words, employment vulnerability may refer to the risk of lacking decent employment (Sparreboom and de Gier, 2008).

Bazillier et al. (2016) note three approaches used to define employment vulnerability. First approach is developed by the ILO (2010) and defines workers in vulnerable employment simply as the sum of own-account and unpaid family workers. However, this definition has several limitations: such as wage employed may have significant risk in employment or individuals working as self-employed may not carry out high risk. Second approach uses income level and membership to trade union to indicate employment vulnerability. Workers at lower income level and without conditions of work arranged by trade unions are considered as vulnerable. (Saunders, 2003; Pollert and Charlwood, 2009). However this approach is more focused on income level, rather than working conditions. Third approach suggests multidimensional measurement of employment vulnerability (Saunders 2003; Bewley and Forth, 2010; Bocquire et al., 2010). Bocquire et al. (2010) propose several indicators to construct employment vulnerability variable. These variables are: job security, job stability, underemployment, unwanted job, unstable remuneration etc. In this research we use multidimensional approach and follow Bocquire et al. (2010) in construction of the employment vulnerability variable.

Theory of compensating wage differentials explains the relation between the wage and employment conditions that may have undesirable features, such as unpleasantness, risky etc. According to this theory a worker must be offered additional amount of wage in order to accept a particular undesirable job (Brown, 1980; Rosen, 1986). Therefore, wage differences among workers with different employment conditions appear. If to consider undesirable job conditions in a broader concept of vulnerability, then this theoretical framework can be used as the basic concept for understanding the wage differentials within the employment vulnerability. Although this research proposal does not aim to test this theory, it can be examined whether workers employed in more vulnerable jobs are paid more than workers with less vulnerable jobs. Since individuals may prefer vulnerable employment if it offers higher immediate earnings, while stable jobs may provide with low payment.
Many papers study the effect of different aspects of employment vulnerability on earnings (Maloney, 2004; Böckerman and Ilmakunnas, 2006; Perry et al., 2007; Bewley and Forth, 2010; Botelho and Ponczek, 2011; Nguyen et al., 2013; Bargain and Kwenda, 2014; Nordman et al., 2016). These studies focus on particular aspects of vulnerability such as informality, adverse treatment in the workplace and different factors of discomfort at the workplaces, while other aspects of employment vulnerability are not involved in the analysis. Only few studies analyse employment vulnerability topic as the multi aspect concept and mainly contribute to measurement of vulnerability and its demographic and labor market characteristics (Sparreboom and Shahnaz, 2007; Sparreboom and de Gier, 2008; Bardhan and Tang, 2010; Bazillier et al., 2016), while lacking quantitative assessment of its consequences.

To our best knowledge only a few paper study the effect of employment vulnerability on wage earnings in a developing country context. Thus, Bocquire et al. (2010) using the cross-sectional data for seven capital cities of West African countries investigated the impact of employment vulnerability on earnings. Their results indicate negative impact of employment vulnerability on earnings. Ndamsa et al. (2013) studied effect of employment vulnerability among private sector workers on household income in Cameroon. They also indicate that employment vulnerability is negatively correlated with income. These studies are based on the cross-sectional data and employs instrumental variable approach. Moreover, to our best knowledge there are no studies on the impact of employment vulnerability in the specific case of Kyrgyzstan.

Relationship between employment vulnerability and earnings may provide with insights on monetary well-being of individuals. However, under the conditions of vulnerability of employment, monetary measurement of well-being may not fully describe individuals' well-being. Non-monetary job characteristics of employment (such as contract type, job task etc.) may have important effect on subjective well-being (Van den Broeck and Maertens, 2017). Subjective well-being has been increasingly used in economics and considered to be complementary to monetary measurement of well-being (Frey and Stutzer, 2002). Low subjective well-being underlines job dissatisfaction, worries about household income, job uncertainty, and health and education worries. These appearances decreases labour productivity, which may have different social and economic consequences. Therefore, along with the earning differentials, one of the important consequences of employment vulnerability is the subjective well-being of individuals.

Most of the empirical studies indicate negative effect of particular employment characteristics (such as informality, causal employment, part-time jobs, self-employment etc.) and unemployment status on subjective well-being (Wildman and Jones, 2002; Bardasi & Francesconi, 2004; Alesina et al., 2004; Sloan, 2004; Bakker van Emmerik, & Euwema, 2006; Böckerman and Ilmakunnas, 2006; Broschak, Davis-Black, & Block, 2008). These negative effects are evident on women and youth (Korpi, 1997; Krauss and Graham, 2013; Van den Broeck and Maertens, 2017). ILO (2017) states that along with limited access to education more women are working in vulnerable forms of employment. Although these studies analyse the relationship between various aspects of employment vulnerability and subjective well-being, within these empirical studies employment vulnerability as the multidimensional concept in the context of developing countries has received less attention.

Given these earlier literature, this research proposal aims to investigate impact of employment vulnerability on earnings and subjective well-being in Kyrgyzstan case. This
study has four main contributions to current economic literature on employment vulnerability.

- First, this is the first study in case of Kyrgyzstan that will analyse employment vulnerability in terms of the multidimensional approach and its impact on earnings and subjective well-being. Therefore, it contributes to scarce empirical literature on employment vulnerability and its effects in the context of developing countries;
- Second, in this research we will use panel data for 2010-2016, while previous studies are based on cross-sectional data. Panel data structure allows us to observe the trend of the employment vulnerability and to analyse time varying effect of employment vulnerability on earning and subjective well-being. Within the panel data we will employ fixed effects model to control for time invariant unobserved characteristics. In addition to this in order to provide with more information about employment vulnerability effects we will use repeated cross-sectional estimations for each wave of the data;
- Third, this research extends previous studies on employment vulnerability impact by including its impact on subjective well-being;
- Fourth, previous studies have explored the effect of employment vulnerability with less attention to gender and youth. In this research along with the total sample, empirical estimates will be on women and youth distinctively.

3.2 Methodology

This research proposal aims to estimate impact of employment vulnerability on earnings and subjective well-being of youth and women in Kyrgyzstan. Most of the empirical papers on the causality between employment conditions and earnings used informality in employment and other similar criteria to measure employment vulnerability (For instance, see: Korpi, 1997; Böckerman and Ilmakunnas, 2006; Bargain and Kwenda, 2014; Nordman et al. 2016; Radchenko, 2017). Only a few papers focus on employment vulnerability as multidimensional issue. Thus, Bocquire et al. (2010) measure employment vulnerability through several variables and estimate its impact on wage. In this research project we follow Bocquire et al. (2010) and investigate employment vulnerability impact on earnings. Along with this, we extend this analysis to study its impact on subjective well-being, which received less attention in empirical studies. Thus methodological framework of this research can be represented in four main sections: construction of the employment vulnerability variable, impact of employment vulnerability on earnings, estimations of its effect over the subjective well-being and repeated cross-sectional approach.

1. Employment Vulnerability Variable
   1.1. Construction of the employment vulnerability variable

Following Bocquire et al. (2010) The employment vulnerability variable will be constructed on the basis of the following dichotomous variables:

1. **Contractual security.** This dummy variable takes value 1 if the respondent has no written contract for current job, and 0 if otherwise. This vulnerability variable deals with informality of the contract.
2. **Underemployment.** This variable takes value 1 if the individual works less than 35 hours per week.

3. **Additional employment.** Working in the second (additional) job shows instability in the main job, hence this may reflect the underemployment and attempt to spread the risk of income loss in the main job. Following the Bocquire et al. (2010) this additional employment variable will take value 1 if the respondent works in the second job.

4. **Whether education obtained is useful professional life.** It indicates education-job mismatch and takes value 1 if received education is not useful.

5. **Duration of work.** This variable equals to one if the individual has been working in the current work less than 12 month, and will reflect the seasonal and casual labor.

6. **Job security.** Workers aspiration about job security and equal to 1 if individual answers that job is not secure.

7. **Job stability.** This variable will be derived from the description of the activity in the last 12 month. Any job changed during the 12 month with any reasons can be considered as not stable. Except maternity leave, education, internship, retirement and military service. If there was a change in job it takes value 1.

The vulnerability dummy variables given above will be summed up and reflect employment vulnerability intensity. Therefore, our employment vulnerability index is continuous variable.

1.2. **Determinants of employment vulnerability**

Simple linear regression model will be specified in order to analyze determinants of employment vulnerability, where dependent variable is the intensity of vulnerability. The set of explanatory variables will consist of individual, household and community level variables.

2. **Employment vulnerability impact on earnings**

2.1. **Baseline model 1**

Most empirical studies on the different aspects of employment vulnerability use a cross-section framework and based on variations across individuals to estimate earnings. However, in this research using the panel data structure we can control for the individual fixed effect and measure earnings variations across time. Then, the benchmark equation for estimation is:

\[
 y_{it} = x_{it} \beta + I_{it} \gamma + v_i + \epsilon_{it}
\]  (1a)

where \( y_{it} \) denotes dependent variable, which is in our case earnings of the individual, \( x_{it} \) the vector of characteristics of individual \( i \) observed at time \( t \) (which includes a constant term), \( I_{it} \) represents employment vulnerability of individual \( i \) at time \( t \). \( v_i \) is the individual fixed effect and \( \epsilon_{it} \) is an i.i.d. normally distributed stochastic term accounting for possible measurement error, \( E(\epsilon_{it} | x_{it}, I_{it}, v_i) = 0 \) for all individuals \( i \) and periods \( t \).

Coefficient \( \gamma \) measure impact of employment vulnerability on earnings. The vector \( x_{it} \) will typically include variables underling individual and household level characteristics and a dummy variable indicating the year in order to take into account any aggregate trend. \( v_i \) is a time-invariant unobservable component and the panel data fixed-effect estimator differences out this time-invariant component.

The main methodological issues in estimation of vulnerability impact over the earnings are
that there is labor market participation selection bias and a likelihood of vulnerability being endogenous in the earnings equations. Hence disregarding the selection into the labor market, in our case wage employees, generated by unobservable characteristics that have impact on entering particular labor market and omitting the other sample may lead to biased estimation results. While vulnerability can be endogenous if the individuals’ unobservable characteristics are correlated with both their employment vulnerability index and their wages, and enter to main baseline model as exogenous variable. Estimations under the endogeneity issue can result in biases.

Application of the panel data fixed effects model neutralize time invariant unobserved characteristics that are potentially correlated with vulnerability variable. Therefore fixed effects model eliminates effect of unobservable time invariant characteristics on employment vulnerability and wage. But time-varying unobservables affecting individuals’ employment vulnerability and wage earnings may still remain in the error term. These may still create biases in estimates. Use of the instrumental variable (IV) approach can provide with the solution, because of this equation (1b) - the endogenous regressor equation, is introduced to the baseline model.

\[
I_{it} = x_{it} \lambda + \mathbf{Z}_{it} \theta + v_i + \xi_{it}
\] (1b)

Employment vulnerability \((I_{it})\) is regressed on instrumental variable \((\mathbf{Z}_{it})\) along with other explanatory variables. Although, finding suitable instrumental variable is difficult task, following the empirical literature and content of the data that will be used in this research potential instrumental variables are \((\mathbf{Z}_{it})\): dependency ratio in the household, household head characteristics \((\text{Bocquire et al., 2010})\); interaction of the household level and community level variables \((\text{Kroeger and Anderson, 2014})\) such as the number of months heating is available during winter time etc. This list of the potential IVs can be extended with other variables used for subjective well-being estimations, which are described in the 3.2 section

2.2. Quantile regression

Impact of employment vulnerability on wage earnings may vary depending on the position in earnings distribution \((\text{Fernandez and Nordman, 2009; Nguyen et al. 2013})\). In order to take into consideration these possible effects Quantile Regression (QR) approach will be applied. Following our notations in the baseline model in equation (1), the model to be estimated can be represented as following:

\[
q_p(y_{it}) = x_{it} \beta'(p) + I_{it} \gamma(p) + v_i + \epsilon_{it}, \; \forall \rho \in [0,1]
\] (2)

where \(q_p(y_{it})\) is the \(\rho\)th conditional quantile of the wage earnings. The coefficient \(\beta'(p)\) provides the effects of different covariates at the \(\rho\)th quantile of the wage earnings distribution. Coefficient \(\gamma(p)\) indicates the impact of the employment vulnerability on wage earnings at the various quantiles.

Taking into account panel data structure in our research Quantile Regression (QR) will be applied within the Fixed Effects. Extension of the standard QR model to Fixed Effects for longitudinal data has been developed by Koenker (2004) and further modified by Canay (2011). According to this unobserved terms can be estimated by Fixed Effects OLS. Then, the
predicted \( v_i \) are used to correct wage earnings within the QR. As mentioned above, endogeneity and selection issues are one of the methodological concerns in this research. For the Fixed Effects Quantile Regression model IV approach with Heckman selection models can be applied too. (for instance, see: Galvao and Montes Rojas, 2009; Galvao, 2011)

3. **Employment vulnerability impact on subjective well-being**

3.1. Construction of the subjective well-being variable

In the literature there are two main approaches in measuring subjective well-being (SWB): cognitive life evaluations and emotional well-being (Helliwell and Barrington-Leigh). The latter one captures positive and negative emotions or affective reactions to life circumstances. Cognitive life evaluations are based on overall life assessment or satisfaction in various life domains of respondents. This approach may be in single-item or multi-item scale in measuring SWB. For the single-item measurement answer to the question: “How satisfied are you with your life?”, is used (Helliwell and Huang, 2014; Wooden and Li, 2014). While answers evaluating different aspects of life can be used to construct multi-scale measurement variable.

In this research our SWB measurement follows cognitive life evaluation approach. We will construct two SWB outcome variables: single-item and multi-item. “Life in Kyrgyzstan” data that we use has distinct section on subjective well-being and includes following questions:

1. How satisfied are you with your life, all things considered?
2. How satisfied are you today with the following areas of your life?:
   2.1. How satisfied are you with your health
   2.2. Your job (if employed)
   2.3. Your household income
   2.4. Your personal income
   2.5. Standard of living of your household
   2.6. Your dwelling
   2.7. Your family life
   2.8. The quality of education at your children’s school
   2.9. Your security
   2.10. Childrens'/young generation's future
   2.11. How would you rate your own current overall situation compared with other people in this town or village?
   2.12. How satisfied are you with the current economic situation of your household?
   2.13. How would you rate your household’s current economic situation compared with other people in this town or village?

These indicators are evaluated by individuals in Likert scale from 0 to 10. The first question on
life satisfaction will be used for the single-item variable construction. Answers to the questions on different areas of life given under the second question (from 2.1 to 2.13) will be used to construct multi-item variable of SWB. Following Hald Andersen (2009) subjective well-being index will be constructed as the sum of the Likert values given for each variable.

3.2. Econometric specification of baseline model 2

Econometric estimation of the effect of employment vulnerability on subjective well-being (SWB) will follow the same approach as in the earnings estimation described above in Section 2.1, hence the second baseline model for employment vulnerability impact on subjective well-being as follows (baseline model 2):

\[ W_{it} = x_{it} \delta + I_{it} \tau + v_i + \epsilon_{it} \]

\[ I_{it} = x_{it} \beta + K_{it} \theta + v_i + \xi_{it} \]

where \( W_{it} \) denotes dependent variable, the cumulative continuous variable on well-being assessment of individuals, which is conditional on individual and household level control variables \( (x_{it}) \) and the employment vulnerability index \( (I_{it}) \) of individual \( i \) at time \( t \). \( v_i \) is the individual fixed effect and \( \epsilon_{it} \) is an i.i.d error term. As the endogeneity concern over the employment vulnerability variable remains, analogous to earnings estimation IV approach will be used. Instrumental variable should be correlated with the employment vulnerability and meet the exclusion restriction, that is, should not affect subjective well-being, except its effect through the employment vulnerability. On this condition, one may argue that the list of the potential instrumental variables should be different from the baseline model 1, as outcome in the baseline model 2 is the subjective well-being, and not earnings. The list of the potential IV variables \( (K_{it}) \) for the baseline model 2 includes following:

- The ratio of household income from household enterprises and property over the average income from these sources measured at the community level.
- Distance to major factory/ other source of employment
- Proportion of the male working age population in this community that has a regular job
- Shock to the community as an inability to sell agricultural and other products

First and second instrumental variables underline vulnerability of employment, but may not related directly with subjective well-being of individuals (Van den Broeck and Maertens, 2017). For instance, location of the major factory in the community might be chosen because of such factors as access to market, resources etc., and not related with the SWB of individuals. However, within our fixed effects estimations this second variable on the distance to major factory may not be suitable, unless there is a new factory or source of employment in the survey year. Therefore, if second variable is not time varying, then still it can be used in the repeated cross-sectional approach explained in the next subsection. Third and fourth variables may also reflect labour market vulnerability situation at the community level and change over time, but is not related directly with the SWB of individuals.

4. Repeated cross-sectional approach - Alternative method of estimations

Although we will use panel data with IV approach, finding good instrument, which should be time-varying within the fixed effect estimations, can be difficult. Another part of potential
instrumental variables are time-invariant that can be used in cross-sectional model specification. Moreover, panel data fixed effects estimation may indicate that time-invariant unobserved characteristics are not source of bias. Under these conditions as an alternative estimation strategy we can follow cross-sectional modeling techniques repeated for each wave of the survey data. Therefore, we will adopt repeated cross sectional analysis, particularly IV-Tobit model, as an alternative estimation technique, which is appropriate for dealing with selection bias and endogeneity issues. At the same time these repeated cross section models will provide us with a robustness analysis for our main panel data estimations.

To account the impact of employment vulnerability on earning and subjective well-being we estimate the following IV-Tobit model:

\[ y_i^* = x_i \beta + I_i Y + \epsilon_i \] (4a)

\[ I_i = x_i \lambda + Z_i^* \theta + \xi_i \] (4b)

where the \( y_i^* \) represents the continuous dependent variable both for wage earning and subjective well-being index of individual and \( Z_i^* \) denotes the vector of endogenous variable for employment vulnerability index \( (I_i) \).

Following the literature the set of variables that will be used as the instrumental variables in the estimation along with above mentioned potential IVs additionally will include the share of employed workers to household size, the education level of the father of individual, the gender of household head, distance to major factory/other source of employment. Corresponding literature indicate that these variable are potentially correlated with the employment vulnerability, but not directly affect earnings and SWB (Kniight et al, 2009; Bocquire et al., 2010; Van den Broeck and Maertens, 2017; ).

3.3 Data requirements and sources

In this research we will use the data from the "Life in Kyrgyzstan" (LIK) survey. This survey is a panel survey conducted annually from 2010 to 2013 and again in 2016. Therefore, our research will be based on five waves of the survey (2010, 2011, 2012, 2013, 2016). We already have access to datasets from 2010 to 2013, while 2016 data is in the process of formatting and according to our personal communication with data collecting team it is expected to be finalized during the September 2017. For more information on 2010-2013 waves of this survey please visit: https://datasets.iza.org//dataset/124/life-in-kyrgyzstan-panel-study-2013

The survey includes sample of 3000 households and more than 7000 individuals for each wave. All adult members of the households are interviewed and tracked overtime. Although sample attrition is an issue in a panel survey, this survey does not indicate considerable change in the initial sample over waves. For instance, according to the survey information out of the original sample in 2010, 81.6 per cent participated in the next three waves.

The survey includes wide range of data including information on household characteristics (composition, education, child education, health etc.), assets, shocks, social networks,
income and expenditure of households. At the individual level the survey contains questions on subjective well-being, labour supply history during the last 12 month, education, health, security, social life, worries etc.

This dataset is the most relevant for our analysis on employment vulnerability in Kyrgyzstan. Although, the main alternative dataset for this research might be an Integrated Household Survey (IHS) conducted by the National Statistical Committee of Kyrgyz Republic (NSCKR) every year. However, "Life in Kyrgyzstan" (LIK) survey has several advantages for our research.

- First, LIK survey includes three level questionnaires: individual, household and community level. Hence, use of the household and community level information during the research may provide with more detailed analysis. While IHS of the NSCKR is mainly based on household level questions.
- Second, as mentioned already LIK survey aims to track the same individuals over time, while IHS is based on rotating panel approach, which changes total sample by 20% for each wave.
- Third, LIK dataset has information on labour supply at the individual and about labour market conditions at the community and household level. Moreover, it has distinct section on the subjective well-being, which is one of the research parts of our proposal.

Because of these features, to our opinion, this dataset is the most appropriate currently available data for employment vulnerability analysis in Kyrgyzstan.
SECTION IV – POLICY ENGAGEMENT

4.1 Policy relevance

4.1.1. Describe policy context and needs

Our research aims to investigate employment vulnerability impact on earnings and subjective well-being. Employment vulnerability as a concept is multidimensional and, hence, outcome of this research has potential to provide with evidence and recommendations on several government policy aspects.

As mentioned above currently socioeconomics conditions of Kyrgyzstan underline weakness of labor market: large scale informal economy, job insecurity, instability of jobs and their sensitivity to general macroeconomic conditions, limited job opportunities for youth and women etc. Moreover, it may have considerable impact on the general public opinion and reflected in different forms of dissatisfaction among population. From this point of view this issue is not only economic and social, but also has reflections into political stability. Findings of this research will contribute to discussions on earnings differentials and subjective well-being among youth and women. In a more comprehensive framework results will help to shed light on the labor market fragility in Kyrgyzstan. This will help to develop strategic vision on labor market development in the long-term perspectives.

To our best knowledge currently there are no government policy actions in the process that aim to reduce employment vulnerability and improve work conditions. Some policy instruments exist to support unemployed individuals through education programs. However, specific policies focusing on the employment vulnerability in Kyrgyzstan are not used yet.

But recently at the beginning of September 2017 the new development program has been announced and approved by the parliament and newly selected government of Kyrgyzstan. This program is closely related with the National Strategy for Sustainable Development of the Kyrgyz Republic until 2040. This program so-called “40 Steps Towards New Era” ("Jany Doorgo Kyrk kadam ") designed for five years. Among the main three objectives of this program “creation of stable jobs, decent work and stable incomes” is underlined. This is much related with the reduction of employment vulnerability. Along with this strategic objective Action No 29 envisages reform of the labor and employment policies. In particularly it focuses on wage policies that should be related with the labor productivity, new measures to promote employment through education programs especially for youth and women.

As this program is new, detailed policy measures to be carried out by ministries are not formulated yet. However, given the strategic objective to provide with job stability, decent work and stable income, it can be expected that the concept of employment vulnerability will be in the focus of government policies. Moreover, by the time of undertaking this research preliminary findings can be consulted with relevant government bodies and other organizations.

To sum up outcome of this research will contribute to the following policy discussions:
1. **Employment policy:** Our overview of labor market intervention of government in Kyrgyzstan indicates that they are mostly related with provision of support for unemployed. However, measurement of labor market in terms of its vulnerability and their analysis are lacking. Existence of the job places itself may not guarantee stability of earnings, job stability, security and adaptation to labor market changes are important for working individuals. Outcome of this research will raise the issue of employment vulnerability in Kyrgyzstan and attempt to attract attention of policy makers to widen the employment policy beyond the unemployment issue and to have more comprehensive vision on labor market trends.

2. **Informal economy:** As already mentioned informal economic activities are widespread in Kyrgyzstan. Different estimations indicate its magnitude as ranging from 40 to 60 per cent, while according to the household survey data about 70 % of individuals work unofficially. In the last 10 years different fiscal measures, such as decrease of the income tax etc., have been taken to decrease the informal economic activities. However, informal economic activities still large. Informal employment is one of the aspects of employment vulnerability and, therefore, findings of this study will contribute to understanding of the individual characteristics and factors of working informally and formally, and earnings differential between them.

3. **Understanding earnings differential:** Current analytical reports in Kyrgyzstan on earnings are limited with the general statistical information on nominal average wage earnings by sectors of the economy. However, to our best knowledge there are no empirical analysis on earnings differential and its underlying factors in Kyrgyzstan case. Research findings on this topic will help policy makers for better allocation of labor force, especially better inform youth and women about earning opportunities and emphasize relevant education programs. Moreover, understanding earnings differentials will help to develop strategic vision on income redistribution policies of government in the long-term.

4. **Youth and Gender policy:** As our research focus employment vulnerability issue with special reference to youth and women, it will inform policy makers with necessary information on employment conditions of youth and women. Research outcomes will strengthen employment policy aspects in youth policy and gender policy in Kyrgyzstan. Currently, these policies are mostly focused on social and political aspects of this issue, such as advancement their interest in the political process, provision with social services etc., while in-depth analysis on their working conditions is not undertaken. Therefore, it will contribute to improve women empowerment measures through better informing about employment and earnings gap.
### 4.1.2. Consultations to date

<table>
<thead>
<tr>
<th>Name of institution/organization #1</th>
<th>The Administration of Government of the Kyrgyz Republic</th>
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<tbody>
<tr>
<td><strong>List the key representative involved in consultations (names and titles/positions)</strong></td>
<td>- Numatova Eliza, Department of Information Support / Leading specialist</td>
</tr>
<tr>
<td><strong>Describe main outcomes of consultation - feedback or inputs received</strong></td>
<td>The preliminary consultation with representative of The Administration of Government of the Kyrgyz Republic show that they are highly interested on quantitative evaluations of labour market and would benefit from our empirical results on preparing analytical reports for governments.</td>
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<tr>
<th>Name of institution/organization #2</th>
<th>Ministry of Economy of Kyrgyzstan</th>
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<tbody>
<tr>
<td><strong>List the key representative involved in consultations (names and titles/positions)</strong></td>
<td>- Albina Suynalieva, Macroeconomic Forecasting Department / leading specialist</td>
</tr>
<tr>
<td><strong>Describe main outcomes of consultation - feedback or inputs received</strong></td>
<td>The representative from the Ministry of Economy of Kyrgyzstan has been contacted and she expressed their interest receiving the research outputs and participating at presentation of the research paper outputs. More detailed policy discussions are possible after receiving the initial outcomes of research.</td>
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<tr>
<th>Name of institution/organization #3</th>
<th>Ministry of Labour and Social Development</th>
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<tbody>
<tr>
<td><strong>List the key representative involved in consultations (names and titles/positions)</strong></td>
<td>- Kulbarakova Meerim, Leading specialist,</td>
</tr>
<tr>
<td><strong>Describe main outcomes of consultation - feedback or inputs received</strong></td>
<td>The consultation with representative of the Ministry show that, the Ministry of Labour and social development particularly interested on determining the vulnerable part of the population, which we have included as the determinants of the employment vulnerability.</td>
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<tr>
<th>Name of institution/organization #4</th>
<th>National Institute for Strategic Studies of the Kyrgyz Republic</th>
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<tbody>
<tr>
<td><strong>List the key representative involved in consultations (names and titles/positions)</strong></td>
<td>- Jamila Irsakova, Leading specialist</td>
</tr>
<tr>
<td><strong>Describe main outcomes of consultation - feedback or inputs received</strong></td>
<td>The preliminary consultation with representative of National Institute for Strategic Studies of the Kyrgyz Republic show that they are interested in proposed research outputs and would benefit from it on preparing the policy brief on labour market situation in Kyrgyzstan.</td>
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<tr>
<th>Name of institution/organization #5</th>
<th>German International Cooperation (GIZ)</th>
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<tbody>
<tr>
<td><strong>List the key representative involved in consultations (names and titles/positions)</strong></td>
<td>- Bolotkan Sydykanov, specialist in Youth program</td>
</tr>
<tr>
<td><strong>Describe main outcomes of consultation - feedback or inputs received</strong></td>
<td>This stakeholder’s main works are related with the youth policy in Kyrgyzstan. It is indicated that they are interested in research findings on youth employment and its implications for</td>
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</table>
earnings. This may provide with the research evidence to focus on needs of youth to improve their employment conditions.

<table>
<thead>
<tr>
<th>Name of institution/organization #6</th>
<th>World Bank (Kyrgyzstan office)</th>
</tr>
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<tbody>
<tr>
<td>List the key representative involved in consultations (names and titles/positions)</td>
<td>Saida Ismailakhunova, Economist</td>
</tr>
</tbody>
</table>

Describe main outcomes of consultation - feedback or inputs received

World Bank is mainly interested in poverty related studies. On our research topic, she is mainly interested in the vulnerability implications for the labour market and how economic trends may have impacted the vulnerability.

4.2. Engagement strategy

4.2.1. Identify target audiences

<table>
<thead>
<tr>
<th>Name of institution/organization #1</th>
<th>The Administration of Government of the Kyrgyz Republic</th>
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<tbody>
<tr>
<td>Explain relevance of this user to inform key decisions</td>
<td>The Administration of Government of the Kyrgyz Republic is the main potential user of our research findings. The research outputs will shed light on main features of labour market and employment vulnerability in Kyrgyzstan, thus the empirical estimation results could be used for adopting new wage policies in Kyrgyzstan envisaged by program &quot;40 Steps Towards New Era&quot; (&quot;Jany Doorgo Kyrk kadam&quot;).</td>
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<tr>
<th>Name of institution/organization #2</th>
<th>Ministry of Economy of Kyrgyzstan</th>
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<tbody>
<tr>
<td>Explain relevance of this user to inform key decisions</td>
<td>The Ministry of Economy is the main state agency planning and implementing projects under the “40 Steps Towards New Era” program. Sharing the empirical results of our research with Ministry would contribute at preparing new wage policy based on empirical analysis on employment.</td>
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<tr>
<th>Name of institution/organization #3</th>
<th>Ministry of Labour and Social Development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explain relevance of this user to inform key decisions</td>
<td>Informing the Ministry of Labour and social Development with the research outputs of proposed study would contribute in employment and social policy design as the Ministry constantly works on social policy development with the focus on improvement of working conditions. In particularly, support of vulnerable workers is the potential topic to attract their policy concern.</td>
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</table>

| Name of institution/organization #4 | National Institute for Strategic Studies of the Kyrgyz Republic |
The National Institute for Strategic Studies is the main analytical centre under the Prime Minister of Kyrgyz Republic, which plays a key role in the implementation of a scientifically based approach to political decisions. Sharing the research outputs of the project with this organisation would have a straightforward influence on the new labour policy discussion under the “40 Steps Towards New Era” program of the government.

The Economic Club of Kyrgyzstan is a popular platform for discussing the economic issues of Kyrgyzstan among the scientific and expert community of Kyrgyzstan. There are regular meetings on economic issues of the country and particularly on employment and labour market topics. Presenting or sharing the empirical results of the research would benefit us with feedbacks of the academicians and experts on labour economics of Kyrgyzstan, and give an opportunity to spread our research among economists of Kyrgyzstan.

4.2.2. Define outreach and engagement strategy

Our stakeholders’ engagement strategy will focus on two groups of stakeholders. First, government organizations that are related with the labor market and employment and their implications for youth and gender policy. Main of them mentioned above. Although, it should be mentioned that during the project implementation political process dynamics in Kyrgyzstan may result in changes such as reorganization of ministries, changes in key responsible persons in these ministries and agencies. Second group consists of representatives of the international donor organizations and NGOs. Constant contact with the second group of stakeholders gives us additional opportunity for policy impact. Since most of the strategic documents in Kyrgyzstan are prepared with the support of international donor organizations through the participation of NGOs. Therefore, this channel of influence can be effective in terms of the policy impact. Both groups of stakeholders will be communicated continuously during the project cycle. Besides we will prepare brief summary of our initial research outputs to disseminate among the local mass media and academic journal in order to raise the issues analysed in the research.

4.2.3. Outline your preliminary dissemination strategy

Preliminary dissemination strategy:
After proposal approval:
- prepare infographics on overview of labour market and employment vulnerability in Kyrgyzstan and publish it on the website of the university and other social networks.
- prepare printed version of a flyer of general overview of labour market condition and employment vulnerability in Kyrgyzstan and disseminate it to organisations of
Kyrgyzstan.

After interim report approval:
- prepare narrative of preliminary results in the form of analytical report for the stakeholders and distribute them
- present the research outputs at national and international level conferences
- participation at the thematic programs and make speeches on our research topic at mass media, newspaper and radio. Our earlier PEP experience showed that this approach is quite effective for policy impact in Kyrgyzstan and getting known as the expert in the specific research field among policy makers.

After final report approval:
- prepare policy brief and make national level roundtable with interested stakeholders
- publish the research paper in journal
SECTION V - OTHER CONSIDERATIONS

5.1. Describe any ethical, social, gender or environmental issues or risks that should be noted in relation to your proposed research project.

The research poses no ethical, social, gender or environmental risk. Our team composition is represented by three females and one male in the team. Other risks related with the conduction of research have been minimised and potential interested parties and policymaking institutions are informed.

5.2 References and plagiarism:

Applicants should be very careful to avoid any appearance of plagiarism. Any text of five or more consecutive words 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](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


Wildman, J., & Jones, A. (2002). Is it absolute income or relative deprivation that leads to poor psychological well being. A test based on individual-level longitudinal data. University of York: YSHE.
