A NEW RELATIONSHIP BETWEEN WAGES AND RENTS IN INDONESIA

Gidion P. Adirinekso
Faculty of Economics and Business, Krida Wacana Christian University
Tanjung Duren Raya No. 4, Jakarta Barat, Indonesia
email: gidion.adirinekso@ukrida.ac.id

ABSTRACT

This study examined the relationship between wages and house rents in the cities level. Merely, the existence of the housing market in the suburb is an critical component to explain relations between two market in two spaces. By applying practical and theoretical considerations, the house rents in suburb are included in this general equilibrium model. We utilize mathematical modeling to find some optimal equations in two markets to know the new relationship between wages and rents in the city level. An estimation using Non-Linear Seemingly Unrelated Regression to proof the relationship between wages and rents empirically. The work found that house rents in urban and suburban affecting wages in an urban area, it brings important policy implications in two markets. There are two considerations for the policy maker. They should consider others markets and spatial aspect when formulating their policies, especially in labor and housing markets

Keywords: wages, house rents, urban labor economics.

INTRODUCTION

Urban economics has been explored in the research about migration, unemployment regarding the differences between wages in the central business district and their hinterland. Todaro (1969) laid the foundation for the framework of labor migration from the traditional sector to the modern sector. After that, many studies was conducted in many countries (Bhattacharya, 2002), Brueckner & Zenou (1999) was tried to relate it with land market, meanwhile, Wasmer & Zenou (2006) using search theory in the model. The last, Wrede (2014), used matching theory in the
Todaro model. But, the relationship between wages and rents was unclear.

Studies using a general equilibrium approach to know the relation between the labor market and the housing market in different places combine with search and matching theory develop by Zenou (2011b). However, Zenou (2011b) considered the housing market in a rural area does not exist.

The purpose of this study is to show the relationship between wages and housing rents in two markets and two places. In particular, there are two aims. First, we make modifications to the Zenou model (Zenou, 2011b), to see the interaction between wages and rents. Second, empirically try to prove a relationship between wages and rents in the simulation and estimation model. Interdependency between two markets in two places is very important for a policymaker to set suitable policies. Hopefully, this study will find the answer of research goals.

**THE MODEL**

In the economy defined \( N = N_{urb} + N_{rur} \), stated that the total number of population (N) consisting of residents in the city \( (N_{urb}) \) and in the village \( (N_{rur}) \). If the unknown people who live in the city consists of those working \( (E_{urb}) \) and the unemployed \( (U_{urb}) \), then \( N_{urb} = E_{urb} + U_{urb} \). Assumed \( N_{rur} = E_{rur} \), all the people in the village is working.

Urban Land market. We have several assumptions: no vacant land, the productivity of the same workers in the city and uniformly distributed linearly and monocentric city, the position of the company exogenous, density residential land parcels is taken to be unity (Zenou, 2011b), which means that there are x units of housing with a distance x from CBD. Each worker in the CBD work and pay commuting costs (commuting costs), \( \tau \) per unit distance. They pay rents for the house \( R_{urb}(x) \), and receive a wage of \( w_{urb} \) which is determined in the labor market through a number who work in the city and job creation in the city. Meanwhile for those who are unemployed will be affected by the cost of looking for a job \( s \), and the cost of the land lease. Under these conditions, it will obtain the optimal bidrents function for those employed and unemployed in the city. Regarding to Albouy’s study (Albouy, 2009), Ezzet-Lofstrom (2004), Xiao (2013) then the amount of the lease obtained optimal for workers in the city:

\[
R_{urb}^*(x) = \frac{\tau}{a_3} X + \frac{(1-s)\tau}{a_3} E_{urb} - \left( \frac{1}{a_4} \right) S + \alpha_3 R_{urb}(N_{urb}) - \alpha_4 R_{rur}(E_{rur})
\]

Equation (1) shows the optimal rents for workers in urban area and equation (2) for unemployed worker.

\[
R_{urb}^*(x) = \frac{st}{a_3} X - \left( \frac{1}{a_4} \right) S + \alpha_3 R_{urb}(N_{urb}) - \alpha_4 R_{rur}(E_{rur})
\]

The labor market in the city. The labor market in the city is not a perfect market because there is friction that arises between workers and companies. Due to the friction in the urban labor market, there are employed and unemployed. Migration of labor from rural to urban areas causes pressure in the labor market. This will cause those who initially unemployed can get a job, but it is also possible they were initially working unemployed for a while to get another promising job. In this model, it is assumed that those who move from the status of work became unemployed and otherwise would be balanced.

The labor market in rural area. The labor market in the rural area is a perfect market, so each person gets the job. It is also assumed that wages in the village are also flexible enough to ensure that there is full employment. Production functions in rural areas are determined only by labor, has the following characteristics:

\( F(E_{rur}) \) with \( F'(E_{rur}) \) > 0 and \( F''(E_{rur}) \) ≤ 0. While the level of wages in the village assumed \( w_{rur} = F'(E_{rur}) \). This means the amount of wages in line with productivity village.

Land market in rural area. The land market in the rural exist. In real terms, the lease of land in the village is also real. Here are some studies relating to the existence of a land market. Taufiqurahman (2013) states that the lease of land plays an essential role in the
formation of wages and household income. While Albouy (2009) generally prove that differences in the cost of utilities and the wage difference are used to determine differences in ground rents. Ezzet-Lofstrom (2004) confirms that the land market exists in a linked site amenities level. Krupka and Donalson (2013) show that the existence of a lease of land is strongly associated with home offers in one location than amenities level.

\[ R_{E}^{urb}(x) = -\frac{1}{\alpha_4} x + \alpha_4 R^{rur}(E^{rur})^3 \]

Equation (3) shows the maximum amount of land rents to be paid by the workers who live in the village. After modification the assumption, we found a new equilibrium wage equation as:

\[
\begin{align*}
W_{E}^{urb} &= \frac{(r + \delta)(1 - \beta)(1 - \gamma)}{r + \delta + \beta a(\theta^{urb})} E^{urb} + \\
&+ \frac{\beta}{r + \delta + \beta a(\theta^{urb})} y^{urb} + \\
&\frac{\beta a_2}{r + \delta + \beta a(\theta^{urb})} \omega AE^{rur\omega - 1} - \\
&\frac{\beta a_3}{r + \delta + \beta a(\theta^{urb})} R_{E}^{urb} + \\
&\frac{\beta^2 a_4 a(\theta^{urb})}{r + \delta + \beta a(\theta^{urb})} - R_{E}^{rur} \text{ .............. (4)}
\end{align*}
\]

Optimal wage rate in the city is influenced by several factors such as workers who work in the city (E^{urb}), job creation (y^{urb}), and productivity of workers in rural areas (\omega (\omega A E^{rur\omega - 1}). Rents in city and in rural area also has impact to city wages. A positive effect on wages in the city through interaction bargaining of workers and enterprises (\beta), the search effort (s) looking for work, transportation costs, market tightness (\theta^{urb}) in the labor market, as well as the discount rate (r), commuting cost (\tau), and the job destroying rate (\delta). On the other hand house rents in the city (R_{E}^{urb}) and in the village (R_{E}^{rur}) has the opposite effect, so the difference will affect both positively or negatively.

If it is assumed that the magnitude 0 < r, \delta, \beta, s, a(\theta^{urb}), \alpha_1, \alpha_2, \alpha_3, \alpha_4 < 1, then the relationship \(W_{E}^{urb}\) with \(R_{E}^{urb}\), \(y^{urb}\), \(\omega AE^{rur\omega - 1}\) is positive. While the difference in land rents in the city and the village, will be negative if the value \(\beta a_3 (r + \delta - \beta a(\theta^{urb})) + R_{E}^{urb}\) is positive, then the difference will affect both positively or negatively.

\[ \beta^2 a_4 a(\theta^{urb}) = R_{E}^{rur}\text{. This means that the greater the difference between the lease of land in cities and in villages, will have a negative effect on wages in the city.} \]

### METHOD OF ESTIMATION

We use Non Linear Squares Seemingly Unrelated Regression (NLS SUR) model to test the equilibrium wage equation (4) empirically. As mention in Greene (2013) SUR method used because we have many equations that indirectly connected. In this study, labor market and housing market are indirectly related. The nonlinear technique was used because of too many parameters for one variable. To do this, we need to set some initial values for some parameters. The assumptions to determine initial values of some parameters, partly follow what is written by Zenou (2011b) and partly based on the conditions in Indonesia. It is described in Table 1.

<p>| Tab 1. Assumptions Of Initial Value Of Parameters |</p>
<table>
<thead>
<tr>
<th>p</th>
<th>iv</th>
<th>p</th>
<th>iv</th>
<th>p</th>
<th>iv</th>
<th>p</th>
<th>iv</th>
<th>p</th>
<th>iv</th>
</tr>
</thead>
<tbody>
<tr>
<td>(\tau)</td>
<td>2.5</td>
<td>(\gamma)</td>
<td>0.1</td>
<td>(\theta^{-\mu})</td>
<td>1.231</td>
<td>(\alpha_3)</td>
<td>0.1</td>
<td>(s)</td>
<td>0.50</td>
</tr>
<tr>
<td>(\delta)</td>
<td>0.12</td>
<td>(\alpha_1)</td>
<td>0.35</td>
<td>(\mu)</td>
<td>0.30</td>
<td>(\beta)</td>
<td>0.20</td>
<td>(\alpha_4)</td>
<td>0.1</td>
</tr>
<tr>
<td>(\theta^{1-\mu})</td>
<td>0.616</td>
<td>(\alpha_2)</td>
<td>0.20</td>
<td>(\theta)</td>
<td>0.5</td>
<td>(r)</td>
<td>0.1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Adirinekso (2015). Note: P: Parameter; iv=initial value
RESULT AND DISCUSSION

There are two critical results in this study, as shown on table 2. First, from technical side, equation (4) gave rise to three new factors that determine the optimal level of wages in the city. Three new factors are the marginal product of labor in a rural area or their wages, housing rents in a rural area and urban area. Second, from practical side, the results of the estimation confirm the modification model of the first results and also the previous model. The wages in the city, regarding Zenou (2011b) was affected by the workers who work in the city and job creation. Both factors positively affect the number of wages in the city. Although with a different model, but theoretically and empirically has proven Zenou model.

| Table 2. Comparison Result Between Zenou And The Modification |
|-------------------|-------------------|
| (1) Zenou   | (2) Modification |
| $s$   0.893*** | 0.989*           |
| $\tau$ 4.652*** | 0.0374***       |
| $\delta$ 4.214*** | 0.00133       |
| $\theta_{1-\mu}$ 2.217*** | 0.0000209**   |
| $r$ 3.907*** | -0.00104**      |
| $\beta$ 0.989*** | 0.640**        |
| $\gamma$ 2956.1 | -1.612          |

Source: Author calculation (2018)

The exciting thing, it turns out that wages in a rural area also have a positive effect on wages in the urban area. When wages in rural area increase encourage workers, or unemployed workers move to the rural area. Moreover, then the supply of labor in the city was decrease, market tightness in the city also decrease so the wages in the city will increase at the moment.

Another thing is, housing rents in the rural and urban area give impact to wages in the city with different directions. Housing rents in the rural area give negative impact to wages in the city, because the workers from a rural area will move to the city and depress the wages down. Instead, when housing rents in city rise give positive impact to the worker in the city move to rural areas. Migration to a rural area will encourage wages in the city increase Zenou (2011a), Song & Zenou (2012). However, there are many possibilities when at the same time housing rents in rural and in urban area change due to others factor. Their impact on wages in the city depending on their direction and magnitude.

CONCLUSION

There are some essential conclusions resulting from this study. First, the labor market in the city very related to the labor market in rural areas; second, the labor market in the city is also very related to the housing market in urban areas; labor market in the city and the last, also very related to the housing market in rural areas.

There are two implications for the policy maker. First, policymaker should consider others markets when taking policy in one market. For example, when they set the minimum wages in the city, it will be safer to think more about housing rents in urban and in rural areas. Second, policy maker should consider spatial aspect when formulating its policies, especially in labor and housing markets.

Acknowledgements

Thank you for comments and suggestions from Reviewers and Participants for draft paper which has been presented at
International Multidiciplinary Conferences on Productivity and Sustainability (IMPS) 2017.

REFERENCES


