Effects of Regional Unemployment on Wages in Vietnam

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Abstract:
It is instructive to see whether the labour market in developing countries shows similar properties as it does in the developed countries or whether it is characterised by traditional or in some countries by transitional features. Therefore, in this paper it is tested whether there is a "wage curve" in Vietnam, whose existence has been confirmed for a number of western countries. A wage curve describes the reaction of wages to regional unemployment. For Vietnam we find with a common two-step procedure that a doubling of the unemployment rate implies a wage reduction of up to 8 % (ceteris paribus). Regressions with individual data show, that the effect is larger in the informal than in the formal sector of the economy.

As far as we know this is the first time a wage curve is found for a Southeast- or South-Asian country. This is due to the availability of an excellent data base for Vietnam.

1. Introduction: Regional wage and unemployment differences in Vietnam

In recent decades an important concept has been used to explain at least part of the wage differentials within countries. This is the "wage curve", which relate regional unemployment rates and regional wages: The higher the unemployment rate, the lower the wage level. Empirical research has found for many countries that this wage effect of unemployment is present. However, most of these countries under study were industrialized countries in Europe and America, only very few analyses for developing countries are known. Therefore, there is a knowledge gap: It is not clear whether the results of analyses of the structure and the dynamics of labour markets from developed countries can be transferred to the developing world.

It is instructive to transfer the concept of the wage curve to a country like Vietnam which is still relatively poor, though its yearly growth rate has been 6.5 % between 1985 and 2015. Now (in 2015) its current national gross national income per capita is 1990 US$ or 5730 US$ according to purchasing power parity. As a comparison: the same

indicators for Germany are 45940 and 48410 US$ (source: World Development Indicators prepared by the World Bank). After passing a transition from socialism to a capitalist market system social inequality has much increased in Vietnam, though it is lower than in other countries of the same stage of development. Still 46 % of the workforce work for a family enterprise in agriculture (Schmillen, Packard 2016: 3).

Switching the view to the relevant regional indicators, reported wages vary notably in Vietnam, which is a developing country showing marked regional differences in the structure of the economy and the labour market (see e.g. Hoang, Mitsuyasu 2013, see Map 2). There are two dominating metropolitan areas Hanoi and HCMC, which have the highest levels of wages, whereas the rural country show only relatively low levels. In the following we concentrate on wages and therefore on dependent employment by excluding incomes of self-employed, entrepreneurs, farmers etc. Table A1 (in the Appendix) shows that average wages in province Can Tho are over 30 % less than those in Hanoi. Maps 1 & 2 two present the distribution of the crucial variables in graphical form. It can be seen that wages are relatively high in the two metropolitan areas and also in some far away provinces which are much involved in the trade with the neighbouring countries.

Vietnamese unemployment rates are remarkably low, in many provinces there is hardly any unemployment. Table A1 shows that the spread was from 0.12 to 3.72 % in the year 2014. Low unemployment rates are due to the informal sector of the economy (see Artus et al. 2015; Blien, von Hauff, Phan 1998): Most people who lose their jobs in the formal sector of the economy (e.g. in state enterprises, joint ventures or larger private enterprises) take up an employment in the informal sector, though their income there is low. They sell beverages at the side of the street or work as "xe om", as motorbike taxi drivers or work for one of the many family enterprises. Therefore, the informal sector functions as a buffer of the economy. This sector consists of small enterprises, family enterprises and self-employed people. However, the productivity gains of the economy slowly dry out the opportunities for employment in the informal sector. Especially in the metropolitan areas informal employment is getting less and less important, because it cannot generate sufficient income to secure a living at these relatively expensive places. Therefore, the unemployment status is getting more important, which is officially recognised by the existence of an unemployment insurance which is only relevant for the formal sector.

In the following we relate unemployment and wages by discussing the concept of the wage curve a little further. In section 3 we briefly present our model and the data basis we use. In section 4 follows the empirical analysis, section 5 is a conclusion.

Map 1: Regional Unemployment in Vietnam

Unemployment 2014

- 0,1 - 0,6 (12)
- 0,7 - 1,2 (14)
- 1,3 - 1,9 (21)
- 2,0 - 2,5 (11)
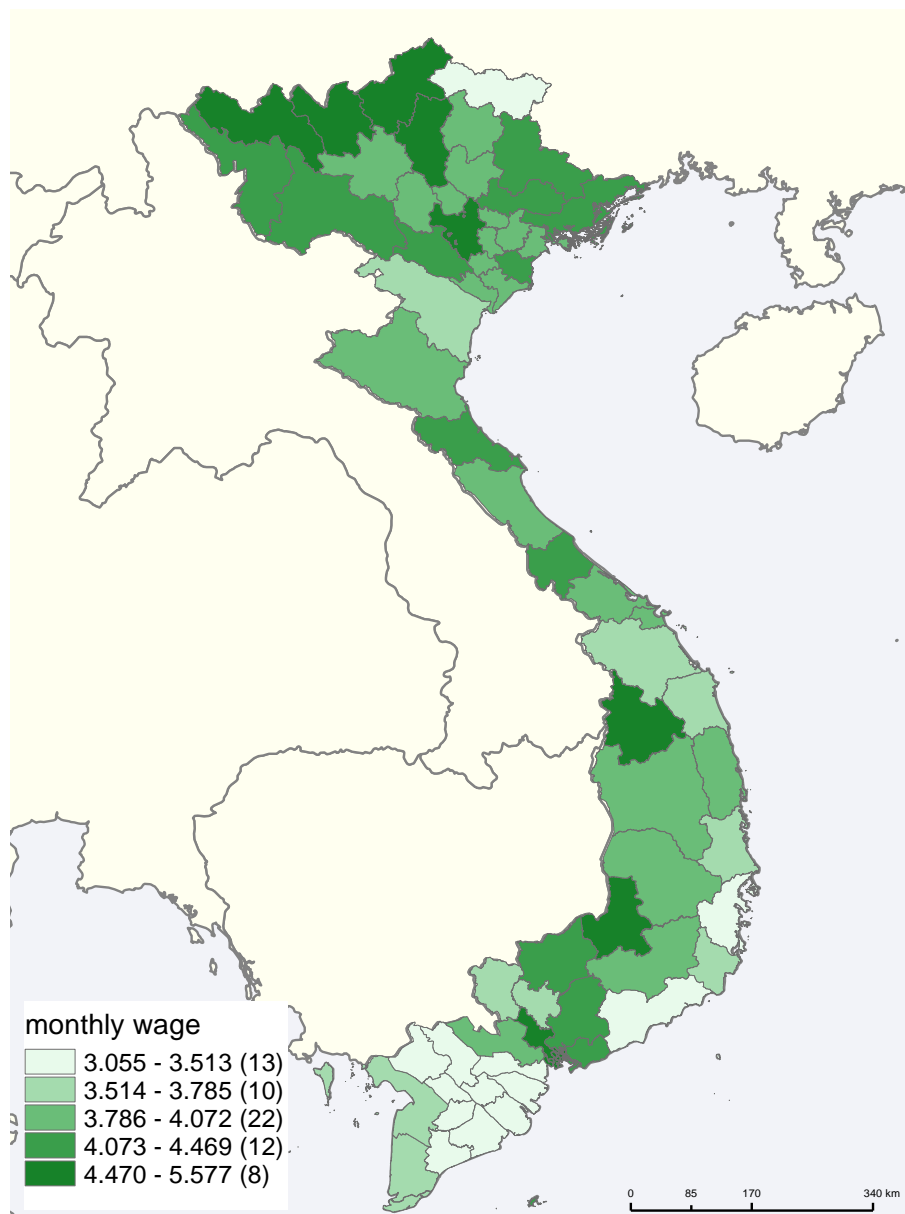- 2,6 - 3,7 (7)
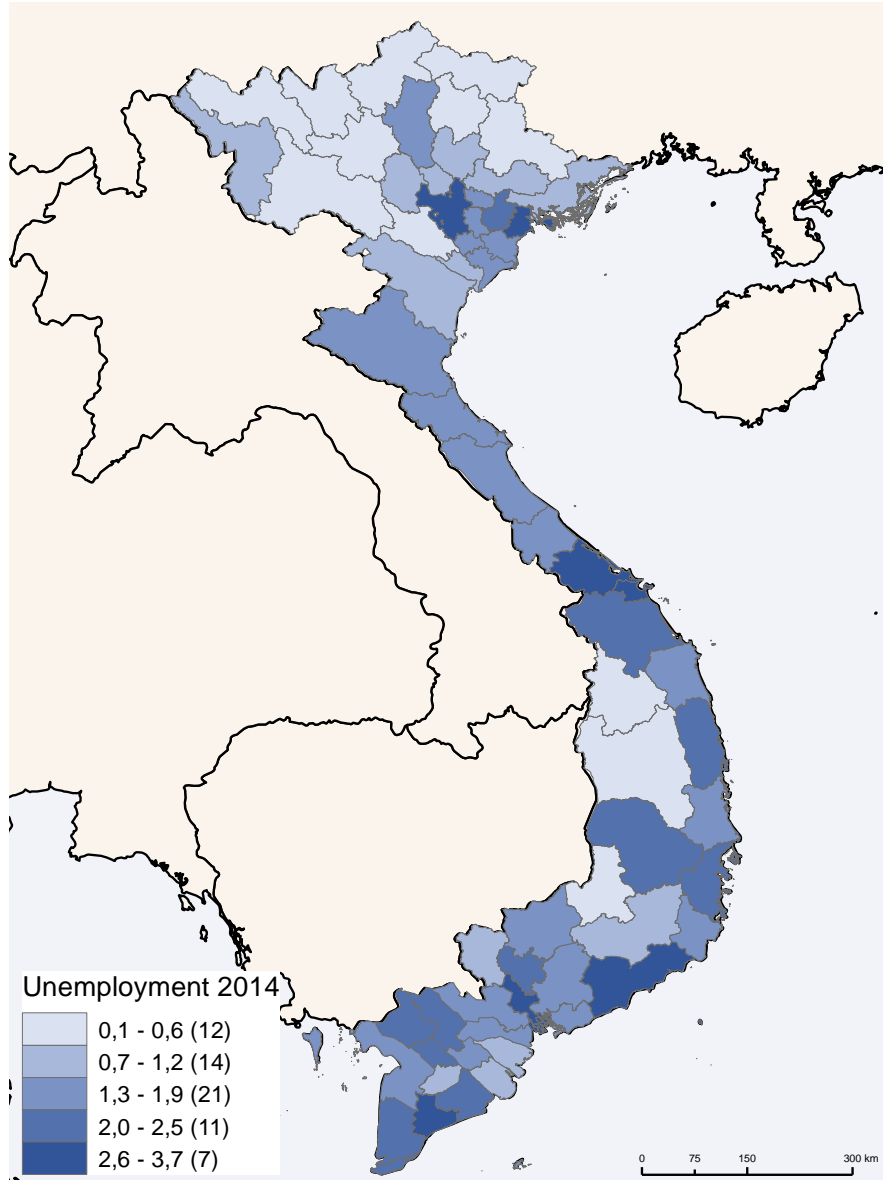
2. The concept of the wage curve

A wage curve is a decreasing function of wages on the regional unemployment rate. Blanchflower & Oswald (1994) argue that low unemployment rates reduce employees' risk of being laid off or alternatively increase their chances of finding another job in the case of having been fired. This strengthens employees' bargaining position and reduces

their incentives to work with high effort. Therefore, according to bargaining or efficiency wage theories, respectively, companies in regions with lower unemployment rates might be induced to pay higher wages, ceteris paribus. In their empirical analyses for a number of countries (including Britain, Canada and the US), Blanchflower & Oswald (1994 & 2005) found that the elasticity of wages with respect to unemployment was -0.1, meaning that a doubling of the unemployment rates reduces wages by about 10 %. The effect was so stable that the authors dared to call it an "empirical law of economics".

Map 1: Regional Unemployment in Vietnam

monthly wage
- 3.055 - 3.513 (13)
- 3.514 - 3.785 (10)
- 3.786 - 4.072 (22)
- 4.073 - 4.469 (12)
- 4.470 - 5.577 (8)

Starting with these seminal contributions many researchers have been able to find this relationship using data from over 40 countries which were mostly western or transitional economies. The survey done by Blanchflower & Oswald (2005) included wage curve studies on 29 countries. In the same year Nijkamp & Poot (2005) published a meta-analysis of the many different analyses of the wage curve. They found that the elasticity of wages with respect to unemployment is a little smaller (in absolute terms) as originally indicated, since it is only about -0.07.

There has been some variation in the methods used for wage curve analyses. However, the standard method introduced by Blanchflower & Oswald and then applied in other studies (e. g. Blien et al. 2013) uses microdata, e.g. from a survey, to control for the heterogeneity of jobs and workers. The response variable is the logarithm of individual wages as in a standard Mincer-type wage function. Fixed effects for regions are included to control for area specific factors, which implies the use of panel data or at least repeated cross-sections. The most important variable, however, is the regional unemployment rate, which is included in log form.

The brief discussion of the role of the formal and of the informal sector of the Vietnamese economy shows that it is potentially important to distinguish between these forms of employment in the analyses. In fact, Baltagi, Baskaya, Hulagu (2014), Barufi, Haddad, Nijkamp (2016) and Baltagi, Rokicki, Souza (2014) found major differences in the wage curves of Brazil and Turkey: The reaction of wages was always stronger in the informal sector. Therefore, it is useful estimating wage curves separately for both sectors of the economy.

3. Model and data

A basic equation to be estimated with data of the labour force surveys 2007 to 2014 is defined in the following way:

$$\ln w_{it} = \ln u_{r(i,t)t}\beta_u + X_{it}\gamma_1 + \alpha_t + \alpha_{r(i,t)} + \varepsilon_{it} \tag{1}$$

There are $i = 1, \dots, N$ individuals, $r = 1, \dots, R$ regions and $t = 1, \dots, T$ time periods; $r(i,t)$ indexes the region in which worker i is employed at time t. The response variable ($\ln w_{it}$) is the log of the wage of worker i at time t. The main independent variable of interest ($\ln u_{r(i,t)t}$) is the log of the unemployment rate in region r at time t, where the subscript $r(i,t)t$ indicates that at time t all workers in region r share the same value for the unemployment rate. X_{it} is a vector of individual characteristics, which are typically included in the empirical literature on wages. In our case they comprise the following variables, all of which are available from the labour force surveys: age and age squared, indicators for gender, for the occupational status, the occupational group, the industry, the educational level, and for the type of business ownership the special worker is related to. α_t denotes a standard macro effect in time period t and $\alpha_{r(i,t)}$ capture time-invariant

unobserved heterogeneity of the region. The remaining error component is represented by ε_{it}.

In equation (1) the unemployment rates are measured at a high level of aggregation whereas individual workers are included at their micro-level. Though the corresponding multi-level problem is solved by the inclusion of fixed effects in the estimation, there is a remaining problem if reverse causality should be taken into account. It could be argued that unemployment not only influences wages, but also that wages influences unemployment. It is standard in wage curve analyses to instrument unemployment by its lagged values. However this strategy does not work properly if carried out with microdata and aggregate unemployment. Now, it could be argued that reverse causality is negligible with microdata since the effect of individual wages on the aggregate unemployment rate is very small. However, many small individual effects could have a major influence on unemployment.

To carry out an IV estimation properly a two-step procedure could be used which was suggested by Card (1995) and carried out by Bell, Nickell, Quintini (2002). Meanwhile, it has become standard with wage curve estimations (see e.g. Brown, Taylor 2015). With this procedure in a first step for all the waves cross-sectional analyses are carried out, which can be described by the following model:

$$\ln w_{it} = X_{it}\gamma^t + \alpha_{rt} + \varepsilon_{it} \qquad (2)$$

In the second step the α_{rt} are the response variable. They can be regarded has regional and time specific wages which are adjusted according to the composition of the local work force and of the local economy. These are related to regional fixed effects and to the regional unemployment rate in the second step:

$$\ln w_{rt} = \alpha_0 + \ln u_{rt}\beta_u + \alpha_r + \varepsilon_{rt} \qquad (3)$$

The second step model is estimated by OLS (baseline) and by to two-stage least squares (2SLS) to realize an instrumental variables estimation (IV). The lagged values of unemployment are the instruments. It is intended to use more than one lag to increase the efficiency of this estimator.

Our major data base are several waves of the Vietnamese Labour Force Surveys, which is an excellent source of data. It is representative at the level of provinces, which are relatively small regions. However, data for the years 2008 & 2009 are not used since the survey of 2008 includes no wage variable and the one of 2009 includes no information on the respective provinces.

The unemployment rates are taken over from official statistics. They are available at the level of provinces and at the level of larger regions (vung). The rates given for provinces are partly very low, then they could be interpreted as outliers. The respective cases are excluded, if they are below 0.3 %. A different strategy would be measuring unemployment at the level of larger regions, where an outlier problem is non-existent.

To discriminate between the formal and the informal sector, employment in one of the many family enterprises is used as an indication of the informal sector.

4. Results

The following tables show the results on the wage curve for Vietnam. Due to lack of space the coefficients for most of the over 200 dummy variables included in the regressions are not shown. In nearly all cases they have "reasonable" values as have the coefficients of the variables presented. Due to the size of the labour force surveys the estimates are very accurate. Unobserved heterogeneity at the regional level caused by unobserved variables is taken out by regional fixed effects (the regional dummies).

Table 1 reveals a remarkable result: Though Vietnam is a developing country, the results on the wage curve are similar to those for the economies of Europe and America. However, the coefficient is smaller to the one obtained in the meta-analysis by Nijkamp and Poot (2005). It is about one half of the average of other countries. This is quite "normal", because for some developed countries, e.g. for Germany, similar values are estimated. The results between the two major sectors of the Vietnamese economy do not differ very much. In fact the wage effect of unemployment is significantly larger in the informal than in the formal sector of the economy, as it was established for other countries (e.g. for Brazil and Turkey). These results confirm that the "buffer" represented by the informal sector of the economy does not block the effect of unemployment on wages. We also calculate wage curves with larger regions (vung) as a robustness check. The unemployment coefficients are larger with larger regions, but the structure of the results remains the same.

Table 1: Wage curves for Vietnamese provinces

The response variable is the log of wages. As independent variables, which are also included but not shown, dummies for provinces (62), periods (5), educational levels (6), occupational statuses (3), occupational groups (45), industries (88), and for the type of business ownership (6) are estimated.

	(1) All workers				(2) Formal sector				(3) Informal sector			
Observations	614665				411454				201703			
R-squared	0,59				0,57				0,54			
	Coef.		Std. err.	t-value	Coef.		Std. err.	t-value	Coef.		Std. err.	t-value
Constant	2.9538	***	0.0130	227.7	2.9627	***	0.0419	70.63	2.6691	***	0.1030	25.91
Ln(Unempl.)	**-0.0343**	***	**0.0019**	**-17.64**	**-0.0303**	***	**0.0023**	**-13.18**	**-0.0440**	***	**0.0035**	**-12.56**
Age	0.0267	***	0.0004	71.84	0.0325	***	0.0005	65.68	0.0302	***	0.0006	53.71
Age^2	-0.0002	***	0.0000	-48.51	-0.0003	***	0.0000	-41.23	-0.0004	***	0.0000	-47.87
Female	-0.1182	***	0.0013	-88.27	-0.0824	***	0.0016	-52.41	-0.1711	***	0.0025	-67.77

*** significant at the 1 % level. Data base: Vietnamese Labour Force Survey 2007 – 2014.

It has to be taken into account that a wage curve is only the effect of regional unemployment. Macroeconomic fluctuations (see To, Le 2016) are taken over by the time dummies also included in the model. Reverse causality might be a problem for the estimates of Table 1. Therefore, we carry out the two-step procedure which has been widely applied in wage curve research. In this approach an IV estimation is feasible. The first step of the analysis controls for the regional heterogeneity of the work force and the economy. Its results are regional/time fixed effects which could be regarded as composition corrected wages. These are collected as being the response variable in the second step which is carried out at the regional level. Besides unemployment only fixed effects for regions and time periods are the exogenous variables. Some of the results for the region dummies are included in Table 2.

The first panel of Table 2 shows the results of a model with fixed effects. The reference category for the regional dummies is Hanoi. It can be seen that wages in the Ho-Chi-Minh City the former Saigon are slightly higher than in Hanoi. The effect of unemployment on wages is the about the same as it is in the model with individual data.

Table 2: Results on the wage curve in the second step

The response variable is the log of wages.

	(4) Panel model				(5) Panel model (IV)			
Observations	363				363			
	Coef.		Std. err.	t-value	Coef.		Std. err.	t-value
Constant	2,6345	***	0,0267	98,53	2,7136	***	0,0549	49,45
Ln(Unempl.)	**-0,0332**	*******	**0,0094**	**-3,54**	**-0,0810**	******	**0,0302**	**-2,68**
Hà Giang	-0,0276		0,0347	-0,79	-0,0790		0,0475	-1,66
Cao Bằng	-0,2246	***	0,0313	-7,18	-0,2750	***	0,0444	-6,19
Bắc Kạn	-0,2226	***	0,0426	-5,22	-0,2554	***	0,0486	-5,25
Hồ Chí MinhCity	0,0686	**	0,0301	2,27	0,0953	**	0,0353	2,7

***, **, * significant at the 1, 5, 10-% level. Data base in the first step: Vietnamese
Labour Force Survey 2007 – 2014.

The second panel of Table 2 was estimated with a 2SLS procedure with three instruments for unemployment by using the first three lags of this variable. Now the unemployment effect is larger, which corresponds to expectations if high wages contribute slightly to high unemployment rates. The effect is significant at the 5 % level.

5. Conclusion

As far as we know, this paper presents the first wage curve for a South-Asian or South-East-Asian country. Though there is a paper by Wu (2004) with an analysis for China, the author did not find a wage curve for this country, he did not have individual data and he could only cover the large metropolitan areas. Blanchflower, Oswald (2005) give an overview on studies about countries for which wage curves have been found, but only very few are about developing countries. The authors quote a paper by Bhalotra, with a wage curve of India, which, however, could not be located. Apparently it has never been published. Therefore, our study is filling a research gap. Analyses on Vietnam are possible, because in the Labour Force Surveys an excellent data base is available.

The wage curve study for Vietnam gives a remarkable result: Though the level of the social product of the country is lower than in other countries which have been studied before, the wage reaction is similar. It does not matter that the Vietnamese economy is still agrarian to a large extent. Its labour market is functioning in a similar way as does the labour market of a western country.

The results give some indication that institutional differences matter for the size of the wage effect: In the formal sector with more rigid rules of remuneration, a controlled minimum wage etc. the elasticity of wages is smaller than it is in the informal sector which takes over most of the effects of unemployment.

Wage differences between regions can be explained at least partly by the effect of regional unemployment. The existence of a wage curve indicates a specific urgency for measures dealing with regional imbalances: Regions with relatively high rates of unemployment are hit a second time by also offering relatively low wages. Workers living there have reduced employment chances due to these two effects.

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Appendix

Table A1: Wages and unemployment in Vietnamese provinces 2014

	Province	Monthly wage (in 1000 VDG)	Monthly wage deflated (base 2007)	Unemployment rate
1	Hà Nội	4899	2398	3,72
2	Hà Giang	5577	2730	0,25
4	Cao Bằng	3491	1709	0,56
6	Bắc Kạn	3994	1955	0,23
8	Tuyên Quang	4566	2235	1,33
10	Lào Cai	4654	2278	0,37
11	Điện Biên	4166	2039	0,76
12	Lai Châu	4640	2272	0,43
14	Sơn La	4299	2105	0,30

15	Yên Bái	4000	1958	0,41
17	Hòa Bình	4451	2179	0,40
19	Thái Nguyên	3929	1923	1,18
20	Lạng Sơn	4234	2073	0,47
22	Quảng Ninh	4469	2187	1,08
24	Bắc Giang	4447	2177	1,03
25	Phú Thọ	3821	1871	1,01
26	Vĩnh Phúc	3896	1907	0,96
27	Bắc Ninh	3880	1899	1,87
30	Hải Dương	4031	1973	2,05
31	Hải Phòng	3995	1956	3,71
33	Hưng Yên	3910	1914	1,60
34	Thái Bình	4187	2049	1,69
35	Hà Nam	3835	1877	1,34
36	Nam Định	3876	1897	1,49
37	Ninh Bình	3958	1937	0,96
38	Thanh Hóa	3785	1853	1,15
40	Nghệ An	3897	1908	1,40
42	Hà Tĩnh	4148	2030	1,69
44	Quảng Bình	4072	1993	1,51
45	Quảng Trị	4187	2049	1,86
46	Thừa Thiên - Huế	3825	1872	2,81
48	Đà Nẵng	3991	1953	3,36
49	Quảng Nam	3717	1820	2,46
51	Quảng Ngãi	3640	1782	1,68
52	Bình Định	3855	1887	2,11
54	Phú Yên	3771	1846	1,35
56	Khánh Hòa	3498	1712	2,48
58	Ninh Thuận	3723	1823	1,87
60	Bình Thuận	3411	1670	3,46
62	Kon Tum	4805	2352	0,44
64	Gia Lai	4022	1969	0,46
66	Đắk Lắk	4049	1982	2,19
67	Đắk Nông	4874	2386	0,12
68	Lâm Đồng	3896	1907	0,79
70	Bình Phước	4123	2018	1,82
72	Tây Ninh	3719	1820	0,97
74	Bình Dương	3686	1804	2,38
75	Đồng Nai	4117	2015	1,63
77	Bà Rịa - Vũng Tàu	4312	2111	1,82
79	TP Hồ Chí Minh	4581	2242	3,00
80	Long An	3907	1912	1,67

82	Tiền Giang	3451	1690	1,52
83	Bến Tre	3488	1707	0,72
84	Trà Vinh	3345	1638	1,24
86	Vĩnh Long	3513	1720	1,92
87	Đồng Tháp	3221	1577	2,28
89	An Giang	3055	1495	2,15
91	Kiên Giang	3553	1739	1,55
92	Cần Thơ	3314	1622	2,53
93	Hậu Giang	3316	1623	1,17
94	Sóc Trăng	3386	1657	2,05
95	Bạc Liêu	3513	1720	2,80
96	Cà Mau	3561	1743	2,01

Data base: Vietnamese Labour Force Survey 2014, official statistics