The Implications of Trade Openness for

the Unemployment Elasticity of Wages

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Abstract:

This paper aims to investigate the impact of openness to international trade on the responsiveness of wages to unemployment. This is explored through separate wage curve regressions in the tradables sectors versus the non-tradables sectors, using occupational, regional and skills based unemployment rates. Based on the extensive empirical work on the wage curve, we propose the unemployment elasticity of pay to be a function of a series of variables effective in the wage bargaining process, such as the sectoral skills/qualifications requirements, the institutional structure of wage bargaining and product market competitiveness. Also along a time dimension, to the extent that opening up to international trade increases the competitive pressures on the product market, the labor market wide wage flexibility is expected to increase and the tradables sector wages are expected to be subject to higher unemployment elasticity of pay than the non-tradables sector. We use Household Labor Force Data from Turkey for the period 2004-2006 to test for any significant variations by trade openness in the responsiveness of wages to regional and occupational unemployment rates. We find mixed evidence in support of our hypotheses: the tradables sector does not necessarily appear to be subject to a higher pay elasticity than non-tradables; yet over the past two decades of liberalization policies in Turkey, we find that there is a substantial increase in the labor market wide wage flexibility; this is observed both in the tradables and non-tradables sectors.

Keywords: Wage level and structure, unemployment, international trade and labor market interactions

JEL Codes:

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I. Introduction

The extensive literature on the so-called wage curve has explored the variety of issues around the responsiveness of wages to local unemployment in different labor markets, time periods and for different groups of workers. The studies have shown that wage responsiveness to unemployment varies substantially amongst different regions, industries and time periods, depending on factors such as the institutional structure of wage bargaining or product market conditions. They also show that the lower the bargaining power of a particular group of workers, such as the young, the unskilled or the non-union members, the higher their unemployment elasticity of pay (Blanchflower and Oswald 1994; 2005).

Any likely interactions between openness of a labor market to international trade and the unemployment elasticity of wages has not been a focus of the wage curve literature so far. This paper aims to explore any effects of international trade on the unemployment elasticity of pay using Turkish labor market data for the period 1988-2006. We go about this task along cross-section as well as time dimensions. The former entails the question of whether there would be any systematic differentiation in wage responsiveness to unemployment between the tradables versus the non-tradables sectors of the economy. To the extent that opening up to international trade increases the competitive pressures on the product market, the tradables sector wages might be expected to be subject to higher unemployment elasticity of pay than the non-tradables sector. This is likely to be so at least in the short-run, and to the extent where the worker's possibilities for switching sectors is limited, if they exist at all. We also explore the issue along a time dimension, and pose the question of whether moving from a closed to an open economy from the 1980s onwards has intensified wage flexibility. To the extent that there is indeed an impact of international trade on the unemployment elasticity of pay, this could provide one of the dimensions of the complex web of channels through which international trade affects labor markets and the wage setting process.

The rest of the paper is organized as follows. Sections II and III provide a background for the ensuing analysis, in terms of the theoretical framework as well as the specifics of the labor market in Turkey. Section IV describes the data set and outlines the methodology. Section V presents the results, and Section VI concludes.

II. Theoretical Framework

The empirical law of the wage curve is commonly interpreted in the context of a wage bargaining model of wage setting. The various imperfectly competitive labor market models of wage setting, namely union bargaining, efficiency wage and insider-outsider models, yield a set of common or similar factors effective in the bargaining process (Carlin and Soskice 1990; Botwinick 1993; Layard, Nickell and Jackman 1994; Blanchflower, Oswald and Sanfey 1996).² Whether in a collective or individual bargaining framework, wages are set such that they are a function of

- the alternative to current wage income:
 - this is generally formalized as unemployment benefits b which set a lower limit to wages such that w has to be greater than b in order to induce workers to perform wage labor;
- the unemployment rate U which inserts a negative pressure on wages; U is a measure of the probability of having to revert to the alternative to current wage income (b);
- workers' versus employer's bargaining power ϕ ,
 - which in union bargaining models is some composite measure of the extent of the level of worker organization, positively correlated to w;
 - or in efficiency wage models, a measure of the strength of the monitoring mechanism where it stands for the probability of the worker being caught by the employer when shirking;
 - or in insider-outsider models, the extent of hiring and on-the-job training costs (turnover costs) enjoyed by insiders to enhance worker bargaining power;
- productivity (value added per worker VA/E) which determines the size of the pie to be bargained over;
 - related to but not exactly overlapping with the productivity variable is also profitability per employee π/E , which is also conditioned by the degree of product market competitiveness;
 - both the productivity and profitability variables are positively correlated to w (serving as reference point in regards to the fairness of the bargained wage), and can be interpreted as some sort of upper limit to the wage rate that can be accepted by the employer whether in the context of a union bargaining, efficiency

² The parallel between the union bargaining and efficiency wage models implies a rent-sharing process in imperfectly competitive markets and individual worker-employer wage bargaining process of wage setting even in the absence of labor unions.

Set against this background most empirical studies so far have formalized the empirical law of the wage curve in the following log linear equation:

$$\log W_{i} = \alpha + \beta \log U_{r} + \delta X_{i} + \varphi_{r} + \varepsilon_{i}$$

where W_{ir} stands for the real wage of individual *i* observed in region *r*; and U_r is the unemployment rate in region r. X_{ir} is a set of measured characteristics of the wage earner *i* which includes personal wage explanatory characteristics such as age, experience, tenure, level of education, gender, race, marital status and so on, as well as his/her job related characteristics such as industrial and occupational affiliation, workplace related factors such as firm size and tax-payer status (ie. whether the workplace and/or the worker is placed in the formal or the informal sector). φ_r stands for regional dummies to account for region fixed effects, other than the variation in the regional unemployment rate.³

To the extent that X_i entails personal, industry, occupation, workplace and job related effects influencing the wage setting process, it covers a whole range of factors related to the bargaining power (expressed as ϕ above), as well as the productivity and profitability variables which would vary across sectors and workplaces. The coefficient β on unemployment then is interpreted as an index of wage flexibility (or rigidity for that matter) in that it measures the extent of responsiveness of the bargaining process to changes in unemployment across time or space. The log linear form in fact enables its direct interpretation as elasticity. Analyses of disaggregated wage curves by regions, industries, or worker characteristics also implies that the coefficient β itself varies along personal, industry, occupation, workplace and job characteristics X_{ir} such that it can be said

$$\beta = f(X_{ir})$$

As the various worker and job characteristics make the wage earner more insulated from the effects of unemployment, the lower the elasticity β , and vice versa. For instance, higher skilled workers

³ For pooled cross-section or panel data, year dummies are also included in the regression equation to account for fixed time effects.

(whether classified on the basis of their education level or occupation) are generally found to enjoy lower unemployment elasticity of pay. This is explained through their higher turnover costs (higher insider power) and/or weaker monitoring possibilities for the types of jobs to which high-skilled workers are assigned, and as such their enhanced bargaining power (ϕ). Similarly, lower wage responsiveness to unemployment seems to be the case for industries with higher unionization and collective bargaining rates; or with imperfect product markets generating rents; formal sector workers (versus informal sector workers), and so on.

Trade openness to the extent that it affects the composition of X_{ir} , might be expected to influence β as well. In other words, part of the much explored impact of trade openness on wages might be operational through effects of trade on a structural aspect of the wage setting process such as the unemployment elasticity of wages. Whether there is any significant differentiation in wage responsiveness to unemployment between the tradables versus the non-tradables sectors has been hitherto an unexplored issue in the context of the wage curve literature.

Studies on the impact of international trade on wages points out to a complex web of channels through which this relationship works out. The most commonly discussed one is where export possibilities or import threats create positive or negative employment effects and influence wages through labor demand (ultimately changing unemployment levels). Yet findings also point out to international trade effects on the structural aspects of the wage setting process. For instance, studies find out that lower trade restrictions lead to wages following productivity changes more closely as the competitive nature of the tradables sector eliminate the rents possible in the non-tradables sectors (Andersen and Sorensen 2008). Trade openness, to the extent that it increases product market competitiveness, exerting more pressure to minimize unit costs and/or limiting the ability of the firm to pass on cost increases as price increases, might be expected to lead to a higher unemployment elasticity of pay through its effects on profitability. Trade openness might be also expected to interact with bargaining power ϕ related factors such as increasing flexibility of labor regulations, firm investment in better technical capacity for more effective monitoring or on-the-job training systems. These in turn would affect labor market flexibility expressed in wage responsiveness to unemployment.

III. Wage setting, unemployment and international trade in Turkey

A long-standing trend in the composition of employment in Turkey has been the declining share of agricultural (rural) jobs, marked particularly by the decrease in the numbers of self-employed and unpaid family workers in agriculture, and the increasing share of urban wage and salary earners. The share of agricultural employment fell from as high as 47 per cent in 1988 to approximately 24 per cent as of 2008.⁴ The structural reform program in agriculture which was launched in 1999 lead to a shedding of over two million self-employed and unpaid family workers in the past decade. In this period, the share of non-agricultural wage and salary earners in total non-agricultural employment increased from 60 percent in 1988 (total 5.7 million people), to 77.3 percent in 2008 (12.5 million people).⁵

The period from the 1980s onwards, is also one where Turkey has embarked on its process of global economic integration. This started initially with the lifting of trade restrictions in the 1980s and a policy switch from import-substitution to export-oriented growth; financial liberalization followed in the 1990s. Turkey's trade volume has increased from a low of 23.8 per cent of GDP in 1986 to as high as 56.8 per cent in 2006 (Figure 1). There has been parallel rises in exports and imports alike, but for most part, the imports entailed intermediate inputs used in export production. Hence the overall employment effect of international trade can be said to have played out positively through domestic firms taking advantage of export possibilities into global markets than import penetration in the home market.

The tradables sectors entail primarily manufacturing with smaller shares of agriculture and mining and quarrying. Employment in the tradables industries accounted for 33 per cent of total employment (excluding unpaid family workers and self-employed in agriculture) altogether in 1988. This share has declined to 31 per cent in 1999, and as of 2008 stands at 29 per cent. This corresponds to close to five million people employed gainfully in the

⁴ As official Household Labor Force Survey data is available only from 1988 onwards, we present the labor market trends only in these past two decades.

⁵ The share of wage and salary earners including those in agriculture in total employment is 33 percent in 1988 and 61 percent in 2008.

tradables sectors in 2008, versus close to 12 million people employed in the non-tradables industries of construction, electricity, gas & water and services including trade, transport, banking & financial services, community, social and personal services. The rise in the share of non-tradables production as a percentage of GDP has been even more dominant than the rise in its share of employment. In 1986, the non-tradables sector accounted for only 52.9 percent of total GDP; by 2006 its share had gone up to 63.4 percent (Figure 2).

The Turkish labor market displays a highly gender segregated profile, particularly for the less than university educated workers. Turkey has got one of the lowest female labor force participation rates in the world as 24 per cent as of 2008 versus 70 per cent for men. The gender gap in participation stems particularly from lower education groups; the labor force participation rate for university graduate women is around 70 per cent, much above the average female rate; and only ... percentage points lower than the male university and above participation rate. For lower education women, labor market engagement is usually of a short-lived nature, taken up at younger ages, prior to marriage and childbirth, and often in the status of secondary family earners. As such the participation of married (unskilled or lower skilled) women, if any, is usually of a transitory nature and prone to discouraged and added worker effects given their tenuous attachment. The frequent economic crises that hit Turkey in the period of financial liberalization (1994, 2001 and 2008) seem to point to stronger added worker effect for females.

Another characteristic of the labor market in Turkey is the dominance and increasing relevance of informal sector employment. As far as unregistered workers are concerned, they make up as high as 24 percent of total non-agricultural wage and salary earners. This represents a substantial increase in their share over the period of liberalization, as they accounted for a lower (but still sizeable) 16 percent of non-agricultural wage earners back in 1988.

The wage setting process can be characterized as largely decentralized as far as the private sector is concerned.⁶ The only official data available on unionization rates is by the Ministry of Labor asserts over 50 percent union membership, yet these official unionization figures are commonly accepted as a gross overestimation. More realistic

⁶ Wage setting in the public sector which is almost one hundred per cent unionized, takes place through the collective bargaining process

estimations range between 10 to 18 percent unionization and approximately 25 per cent collective bargaining coverage (Ilkkaracan 2005).⁷ The dominant level at which the bargaining takes place in the private sector is at the firm level; and to the extent that collective bargaining takes place it is on a industry scale entailing only formal sector workplaces. The availability of some legal mechanisms for extension of collective bargaining coverage to non-union members enables collective bargaining is prevalent primarily in the manufacturing sector, and has been on the decline in the past two decades of trade and financial liberalization.

While the urban unemployment rate has always been in the two-digit figures for the past two decades, the relatively lower rural unemployment rates has contributed to keeping the country-wide average lower (Figure 3). From the 2000-2001 economic crisis onwards, exacerbated by the simultaneous launch of the agricultural reform implementation program, both urban and rural unemployment rates take an upward turn. The situation of already a persistent level of unemployment is made worse by the recent economic crisis, with country wide unemployment rate at 13.6 percent; urban and non-agricultural unemployment as high as 16.5 and 17.0 per cent respectively.

IV. Data and Methodology

Our data source is Household Labor Force Survey (HHLFS) annual data from Turkey for the years 1988 and the period 2004-2008. The sample for the analysis entails urban wage and salary earners in the Western and coastal regions including six geographic regions defined at the NUTS 1 level, namely, Istanbul, Western Marmara (Tekirdağ-Balıkesir), Aegean (Izmir, Aydın, Manis), Eastern Marmara (Bursa-Kocaeli), Western Anatolia (Ankara-Konya) and the Mediterranean (Antalya, Adana, Hatay). The self-employed and unpaid family workers were not included. We have excluded the economically underdeveloped Eastern regions from the analysis as their urban labor market structure has hardly matured; prone to strong effects of an adjacent rural sector dominated by small-family farming, as well as the dominance of public sector employment amongst wage and salary earners. The wage earners of the included

⁷ These figures are based on registered (i.e. formal sector) workers. Including non-registered workforce would pull these rate seven lower. A recently added question to the household labor force survey has found that the share of union members amongst total labor force is as low as 10 per cent.

Western and coastal regions corresponds to approximately 10 million people, making up the lion's share of total wage and salary employment (78.3 per cent) as of 2008.

In the first part of the analysis, we use pooled cross-section micro individual level data derived for the period 2004-2008 to run the following standard log linear form of the regression equation:

$$\log W_{irt} = \alpha + \beta \log U_{rt} + \delta X_{irt} + \gamma DUR_{rt} + \eta OPEN_{rt} + \varphi_r + Dt + \varepsilon_{irt}$$

The dependent variable W_{irt} stands for the real hourly wage of individual *i* observed in region *r* in year *t*. The nominal hourly wage is divided by the regional consumer price index at NUTS2 level to derive the real hourly wage rate, which is expressed in 2004 prices.⁸

The unemployment rate that we use is U_{rt} which is a more restrictively defined unemployment rate observed in region r in year t. This entails the regional unemployment rate observed in six Western-coastal regions categorized at NUTS 1 level for 5 years; hence a total of 30 regional unemployment observations. We have enhanced the unemployment effect by adding a second regional variable on duration of unemployment, which we define as the average number of months of unemployment duration.

X_{irt} ,	the	set	of	measured	characteristics	of the	worker	or	of	her	job	includes	the	following
varia	bles:													

Dependent variable	Log real hourly wage			
Independent variables				
Ur	Regional unemployment rate			
age	categorical variable including 10 age groups ⁹			
edu	years of schooling			
gend	gender; female 1; male 0			
sosec ¹⁰	work related social security; under social security 1, 0 otherwise			

⁸ The monthly earnings data provided in the HHLFS is divided by the number of weekly work hours times four to yield hourly earnings. Given the criticisms re: responsiveness of results to specification of the dependent variables as hourly versus monthly earnings, we have tried different forms and the results were robust.

⁹ Age categories range from the lowest age profile of workers between 15-19 years old; to the highest one of 65+.

¹⁰ The social security coverage variable can be interpreted as formal vs. informal divide.

status	martial status; married 1, all other status 0
skill ¹¹	three levels of skills-based occupational controls
part-time	part time jobs 1; full time jobs are 0
additional_work	workers with additional jobs 1; those without 0
workplace_s	firm size; less than 25 workers
workplace_m	firm size; 25-50 workers
public	public employer 1, private employer 0
tenure	years of employment at current job
open	trade volume per worker
trade	traded sector 1; including sector nace_1, nace_2 and nace_3
industry dummies ¹²	9 industry dummies
region dummies	6 region dummies
year dummies	5 year dummies

The set of industry, region and year dummies to cover for fixed effects.¹³

The standard wage curve regression is enhanced by a variable that measures regional trade openness, which we define as trade volume (regional exports plus imports) per worker measured in US \$. We expect regional trade openness to increase the competitiveness of the product market with similar repercussions for the labor market, leading to a downward pressure on wage levels. Yet to the extent that this variable picks up on positive productivity enhancement or employment generation effects, it might also be expected to enhance wage levels.

¹¹We categorize the sample into three groups with respect to worker qualifications, characterized by the occupation of the worker. We use three different skill levels by using international standard classification of occupations (ISCO 88). Skill Level 1 may need physical strength and/or endurance. For some jobs basic skills in literacy and numeracy may be required and it rarely requires specific on-the-job training. Many occupations at skill level 2 level require relatively advanced literacy and numeracy skills. Skill and competence in this level generally need higher educational levels such as secondary or vocational high school and significant educational capacity for specific on-the-job training. The skill level 3 includes mostly workers having tertiary educational level or having extensive relevant work experience.

¹² Agriculture, hunting and fishing is the base for the tradable sector regressions; while electricity, gas and water is the base for regressions for the non-tradables sector.

¹³ Year and region dummies cover for time and geographic effects in the labor market or the aggregate economic environment other than unemployment. The reference base for industry is community, social and personal services; for region is Istanbul, and for year it is 2008.

Following from the theoretical framework above, the ensuing analysis would have benefited from the inclusion of two additional variables influencing wage determination. One is an institutional variable; namely union membership and/or coverage of the worker by a collective bargaining agreement. While the labor market wide unionization and collective bargaining coverage rates are low as mentioned in Section III above, there is considerable heterogeneity across industries and firm size. As the HHLF Survey data provides information on neither union membership nor collective bargaining coverage, we rely on our industry dummies and the firm size variable to control for the institutional heterogeneity across industries. The other variable that would have been preferably placed in the analysis is a productivity or profitability variable; at best at the level of the workplace if not at the level of disaggregated industry. Yet neither one is available, and once again we rely on the industry, region and year dummies as well the firm size variable to pick up on productivity and profitability variation across industries and firms.

The wage regression is of a double logarithmic form common in most wage curve studies, such that the coefficient on unemployment β yields the unemployment elasticity of wages. We divide the sample into tradables versus the non-tradables sectors. The tradables sectors include agriculture, hunting & fishing; mining & quarrying and manufacturing. The non-tradables sector include electricity, gas & water; construction; wholesale & retail trade, restaurants & hotels; transportation, communication & storage; finance, insurance, real estate & business services; community, social & personal services. Our main hypothesis is that, after controlling for all the wage determinant variables, the unemployment elasticity of wages in the tradables sector will be greater than that in the non-tradables sector given the relatively better insulation of the latter from product market competitiveness.

Given the substantially different character of male employment than female as mentioned in Section III above, we also expect that wage setting behavior in responsiveness to unemployment can also vary along the gender dimension. Hence we run separate wage regressions for male and female employees in the tradables and the non-tradables sectors.

In the second part of the analysis, exploring the changes in the unemployment elasticity of pay across time, we use cross-section data from the HLFS for 1988 to estimate the labor-market wide unemployment elasticity of pay, as well as separately for the tradables and the non-tradables

sectors. We compare these indicators of labor market flexibility from the 1980s, when market liberalization efforts had just started, to a series of cross-section regressions that we run for the years 2006-2008. Our expectation here is that in this approximately two-decade period marked by intensive economic liberalization policies in Turkey, both the labor-market wide as well as the tradables and non-tradables sector elasticities to demonstrate an increase.

V. Results

We first report in Table 1 the results of the wage regressions for the overall sample of urban wage earners, as well as disaggregated by gender, private and informal sectors. Here we use the standard wage curve specification to first look force evidence of a wage curve in the labor market in Turkey. The standard specification is contrasted against one expanded by including the regional trade openness variable. We find evidence for a wage curve for the overall sample of urban wage earners with a labor market elasticity of -0.064. Accordingly a doubling of the regional unemployment rate (100 percent increase) would be associated with a 6.4 percent decrease in the real wage.

Disaggregation by gender shows the male private and informal sector workers to be subject to higher pay responsiveness. Using the standard specification, we find the unemployment elasticity of pay for private sector male workers at -0.09 and even higher for informal sector male workers at -0.156. Hence we provide evidence for the substantially higher flexibility (and vulnerability) of informal labor markets.

Including the international trade variable of regional openness, we find that the unemployment elasticity of wages demonstrates a substantial increase from -0.095 to -0.230 for the overall male sample; and from -0.156 to -0.299 for the informal sector male workers.

We find a statistically insignificant (and positive) coefficient on the unemployment variable for the female sample. Our findings corroborate the lack of evidence for a female wage curve in Turkey shown by an earlier study on the topic, using cross-section employer-employee data set for the manufacturing sector in 1994 (Ilkkaracan and Selim 2003). This is not surprising given very low female participation rates, and the transitory nature of female participation as secondary income earners. In the face of high unemployment rates, it is likely that women are, disproportionately to men, amongst the first ones to leave the labor force altogether, joining the ranks of the non-participants. If this is the case, the female employment profile would be tilted towards higher education workers on the upper end of the pay spectrum and with stronger labor market attachment. As for the unskilled female workers, another possible account of the lack of responsiveness of their wages to changes in the unemployment rate could be their concentration at the lower end of the wage spectrum. If a worker is hardly getting a wage premium over and above the reservation wage b, then there would be hardly any space for higher unemployment rates to repress the wage level further.

The variable on regional openness to trade is negative and statistically significant for the overall male sample as well as male private sector workers, weighing the evidence in favor of a negative correlation which was one of the possibilities mentioned above. The effects of trade openness towards elimination of product (and hence labor) market rents through increasing competitiveness puts downward pressure on wage levels.

Table 2 shows the results using the same pooled sample for 2004-2008 and the same wage regression specification, yet this time disaggregating the sample by tradables versus non-tradables. Contrary to our hypothesis, we find that a strong wage curve effect exists for the non-tradables sector, where the unemployment elasticity of pay is -0.32 for the overall male sample, and as high as -0.47 for private informal sector male workers in non-tradables. These magnitudes of the β coefficient are quite high and require closer scrutiny.

As for the tradables sector, the coefficient on the unemployment term for the male sample continues to be negative, yet it is much lower contrary to our expectations, and it also loses its statistical significance. We have only weak if any, evidence for the existence of a wage curve in the tradables sector. As for the female sample, we continue to observe a positive yet statistically insignificant coefficient on regional unemployment.

What could explain the much higher flexibility of the non-tradable sector than the one observed in the tradables sector? If what we are observing is not a mishap of econometric estimation of data, we need to look for factors that enhance the unemployment elasticity of pay in the non-tradables industries relative to tradables. One quick explanation that comes to mind, is an underspecification problem. The two variables that we said (above in Section IV) we preferred to include for a more complete analysis of wage determination, namely the institutional variable of collective bargaining and productivity, can be responsible. The tradables sector is known to exhibit higher productivity growth relative to non-tradables. Moreover, given that the nature of the organization of production in tradables industries such as manufacturing or mining & quarrying, in large size workplaces and centered around

manual work, it also exhibits higher rates of unionization and collective bargaining. Both factors might be responsible for relatively higher insulation of tradables sector wages from changes in the local unemployment rate.¹⁴

In addition, it is possible that there is some differentiation in personal productivity of individual workers to the favor of tradable sector, which the education, age (experience) or tenure variables fail to pick up. If relatively more extensive specialization and on-the-job training characterizes the tradables sector, then their wage bargains might be better insulated from the negative influences of rising unemployment rates.

The openness variable continues to be negative in the tradables sector for the male sample, yet it is driven to insignificance for the overall male sample in non-tradables; statistically significant only for the private non-tradable sector male workers, yet of a reduced magnitude relative to their tradable sector counterparts.

Finally, we explore any change in the unemployment responsiveness of wages in the Turkish labor market through time, in particular in the past two decades of economic liberalization efforts and structural change towards global integration. Table 3 presents the results of cross-section wage curve regressions for 1988, which is the only HLFS data set prior to 2004 that contains wage data. Table 3 also presents comparable cross-section regression results (using the same set of explanatory variables) for 2006, 2007 and 2008.

Using cross section data, we do find evidence for a wage curve also in the tradables sector. The coefficient on unemployment is negative for all years and driven to statistical significance at the 1 percent level. Similar to the results of the pooled regression, for each year except 2008, the unemployment elasticity of wages is higher in the non-tradables sector than in tradables. In 2008, the year of the global economic crisis, we observe a formidable increase in wage elasticity both in the tradables and non-tradables of all years. And this time the tradables sector exhibits a relatively larger negative coefficient on the unemployment variable than in non-tradables.

¹⁴ Estimation using 2006 HLFS data and including a proxy variable for sectoral collective bargaining coverage rates did not seem to affect the results in any substantial manner except for lower elasticities generally.

Comparing our results for the year 1988 with the results from 2000s, we find that there is significant increase in the responsiveness of wages to unemployment both for the tradables and non-tradables sectors as expected. This is so even without taking the crisis year of 2008 into consideration. The elasticity that we find for the tradables sector using 1988 data is at - 0.120; while for 2006 it increases to -0.279, 2007 it is of a similar magnitude to 1988 (-0.120); yet in 2008 the year of the local and global economic crisis, it exhibits the highest elasticity encountered so far at -0.659. The discrepancy observed in the year 2007, again requires a closer investigation. For the non-tradables sector, the flexibility coefficient β increases from - 0.161 in 1988 to the -0.33 to -0.46 range in the 2000s.

VI. Conclusion

This paper has explored the possibility of a structural differentiation between the tradables and non-tradables sector wage setting processes in terms of any possible differences in their wage curves, i.e. the unemployment elasticity of tradables wages versus non-tradables. Our departing point consisted of two interrelated hypotheses. The first one explored the wage flexibility – international trade interaction from a shorter term cross-section perspective. In any given period, we expected the wage flexibility of the tradables sector to be higher than that in the non-tradables sector, controlling for all other wage determinant factors. The second one approached the issue from a longer time perspective. We suggested that opening up of a labor market to international trade would enhance wage flexibility –whether in the tradables or the non-tradables sectors- through increased competition in the product market and the pressures that this process of global integration will exert on the labor market.

We used Household Labor Force Survey data from Turkey for the period 1988-2008, a period of increasing openness of the Turkish economy through structural reforms for market liberalization, to test the two hypotheses using enhanced wage curve regressions. Our results are mixed. The pooled regression analysis for the 2004-2008 period, yields strong evidence for a well-defined wage curve in the non-tradables sector; while there is weak, if hardly any support for the existence of a wage curve in the tradables sector. The coefficient the on unemployment variable, which we use as the flexibility indicator is negative but statistically insignificant. When we run cross-section regressions for each separate year in the same period, a well-defined wage curve emerges also in the tradables sector, but again the extent of flexibility is relatively lower as compared to what we find for non-tradables.

We explained this finding, which is contrary to our expectations, due to a possible underspecification of the regression equation because of lack of appropriate data. Specifically the analysis lacked variables on collective bargaining coverage of the worker and union membership, as well as variables on sectoral productivity and profitability. Collective bargaining practices and unionization are more prevalent in the tradables sector, likely to dampen wage responsiveness to unemployment. Moreover, the tradables sector is known to enjoy greater productivity growth which might again affect the unemployment elasticity of pay.

Somewhat related to the productivity factor, we also suggested that unobserved productivity traits of individual workers in the tradables sector might be responsible for the findings contrary to our expectations. Tradables workers are likely to accumulate better human capital through higher levels of investment in on-the-job training and higher degree of specialization in qualified and semi-qualified jobs. This would enhance their insider power in the bargaining process providing relatively better insulation against unemployment.

Our second hypothesis of increased wage flexibility throughout the trade liberalization period that Turkey went through from the 1980s onwards has been confirmed, as we found that wage responsiveness has been substantially enhanced in the non-tradables and tradables sectors alike.

The above provide an initial set of findings on new terrain in the context of the extensive literature on the wage curve. The analysis needs to be expanded through possible extensions of the data set to compensate for the missing variables.

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Figure 1: Total trade volume as % of GDP – 1986-2006

Source: Turkstat





Source: Turkstat

Figure 3: Unemployment in Turkey 1988-2009



Source: Turkstat; 1988 data is for the month of October and 2009 data is for the month of May; all other observations are annual averages.

Table 1: Unemployment Elasticity of Wages	2004-2008: with and	without the trade
variable OPEN included in the regression		

	All urban wage earners	Male urban wage earners	Female urban wage earners	Male urban private sector wage earners	Male urban private informal sector wage earners
lnU	-0,064**	-0,095***	0,033	-0,090***	-0,156**
(OPEN not included)	(-2,470)	(-3,243)	(0,620)	(-2,603)	(-2,317)
lnU	-0,143***	-0,230***	0,093	-0,235***	-0,299***
(OPEN included)	(-3,277)	(-4,688)	(1,005)	(-4,142)	(-2,900)
	-0,001**	-0,002***	0,001	-0,003***	0,001
OPEN	(-2,119)	(-2,825)	(0,631)	(-3,448)	(0,529)
No. of observations	215,236	161,630	53,606	128,203	39,699
Adjusted R2	0.551	0.545	0.587	0.426	0.340

The dependent variable is the natural log of real hourly wages. All regressions include personal controls as well as industry, region and year dummies. t-statistics are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

			БТ		Male urban
	All urban	Male urban	Female	Male urban	private
	wage	wage	urban wage	private	informal
	earners	earners	earners	sector wage	sector wage
				earners	earners
lnU	-0,002	-0,018	0,006	-0,035	0,056
tradables	(-0,031)	(-0,230)	(0,037)	(-0,436)	(0,337)
OPEN	-0,003***	-0,004***	-0,001	-0,003***	0,004
tradables	(-3,022)	(-3,454)	(-0,678)	(-3,054)	(1,466)
No. of	58 222	45 077	12 155	12 111	10 122
observations	50,252	40,.077	13,100	45, 141	10,425
Adjusted R2	0.453	0.442	0.459	0.405	0.339
lnU non-	-0,205***	-0,320***	0,108	-0,360***	-0,465***
tradables	(-3,766)	(-5,128)	(0,989)	(-4,600)	(-3,562)
OPEN non-	-0,000	-0,001	0,000	-0,002*	-0,001
tradables	(-0,569)	(-0,786)	(0,216)	(-1,794)	(-0,301)
No. of					
observations	110,694	82,339	28,355	57,110	22,373
Adjusted R2	0.572	0.569	0.590	0.421	0.334
					1

Table 2: Unemployment Elasticity of Wages 2004-2008: Tradables versus Non-tradables

The dependent variable is the natural log of real hourly wages. All regressions include personal controls as well as industry, region and year dummies. t-statistics are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

 Table 3: Unemployment Elasticity of Wages through time: 1980s versus 2000s (men only)

	19	88	20	06	20	07	20	2008	
	tradables	non- tradables	tradables	non- tradables	tradables	non- tradables	tradables	non- tradables	
lnU	-0,120* <i>(-1,770)</i>	-0,161*** <i>(-5,058)</i>	-0,279*** <i>(-6,645)</i>	-0,403*** (-21,310)	-0,120*** <i>(-2,680)</i>	-0,332*** (-16,284)	-0,609*** (-13,981)	-0,456*** (-25,218)	
No. of observations	3,303	6,204	14,307	31,100	14,044	31,827	14,665	32,163	
Adjusted R2	0.347	0.374	0.507	0.620	0.467	0.608	0.493	0.619	

The dependent variable is the natural log of real hourly wages. The unemployment rate is disaggregated by region and education to provide increased diversity of observations as cross-section data does not entail the variation through time. All regressions include personal controls as well as industry, region and year dummies. t-statistics are in parentheses.

*** p<0.01, ** p<0.05, * p<0.1