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***Intra-industry trade and labor costs: The smooth  
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# **Intra-industry trade and labor costs: The smooth adjustment hypothesis**

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**Abstract.** According to the smooth adjustment hypothesis (SAH), the labor-market adjustment costs in the form of unemployed resources will be lower if trade expansion is intra-industry rather than inter-industry in nature. This is what we attempt to test empirically using the Brulhart (1994) marginal intra-industry trade (MIIT) index and a dynamic panel data analysis. Considering the contemporaneous effect the results do not support the SAH. However, if we consider the one- year and-two years lags effects, the conclusion is different and it is sensitive to the size of the lag. Comparing with other empirical studies our results suggest that the validity of SAH depends on the variable choose as adjustment labor cost index, the time lag structure and the set of control variables.

**KEY Words:** Adjustment costs; labor market; marginal intra-industry trade.

**JEL Code:** C33; F16; J30.

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## I. Introduction

The concept of marginal intra-industry trade (MIIT) is a central concept in the analysis of labor market adjustment costs and trade patterns. Usually, it is considered that the Brulhart (1994) MIIT index is more adequate than the Grubel and Lloyd (1975) static index to explain or testing the relationship between labor market adjustment and intra-industry trade (IIT). The variation of Grubel and Lloyd index between two periods is not a good dynamic alternative, because it “hides” the type of the marginal trade. The MIIT index varies between 0 and 1, where the value 0 means that the marginal trade in industry is exclusively of the inter-industry type, and the value 1 represents that the marginal trade is entirely of the IIT type. As the empirical studies did not find a high correlation between the two indexes the econometric results are different according to the index used. The hypothesis that IIT expansion will bring lower labor adjustment costs than inter-industry trade expansion is known as the smooth adjustment hypothesis (SAH). Underlying to the SAH is the assumption that the higher the proportion of new trade that is of the IIT type the smaller is the distance of job moves and related adjustment costs. At one extreme when all new trade is of the IIT type the workers are not displaced or they will move within their industry or their firm (“low-distance” assumption). In this case industry employment changes between  $t$  and  $t+1$  can be used as an inverse proxy for labor adjustment costs. The higher the employment changes within the industry the lower the adjustment cost. In the other extreme if the new trade is of the inter-industry type there are reallocation of labor from the contracting industries to the expanding industries and a distance of a job move increases as well as the adjustment costs. So, if the SAH is valid we may expect that an increased in MIIT index has a neutral or a positive effect on the industry employment changes.<sup>1</sup>

This paper tests the SAH and it also wants to know if the MIIT effects are persistent or not in one-year lag and two-year lag. Furthermore, the paper estimated the global effect of trade variables on Portuguese employment growth, controlling the effects of other relevant variables as productivity, wage, industrial concentration, scales economies, human capital, physical capital intensity, for example. The findings of the paper are not consistent with the SAH and do not confirm the results of other research that employed a similar adjustment labor cost indicator (see, for example, Brulhart and Elliot, 1998, Brulhart, 2000). The paper analyzes the impact of trade and marginal intra-industry trade

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<sup>1</sup> However, there are other empirical studies that used a different dependent variable as a proxy for adjustment costs and the SAH implies a negative expected sign for sign MIIT (see, for example, Brulhart et al., 2006)

on Portuguese employment changes, using a dynamic panel data for the period 1996-2003. It was considered the bilateral trade between Portugal and European partners (EU-15) and the employment turnover in 22 industries.

The paper introduces a dynamic panel data model because the employment change involves adjustment labor costs in different periods of time. A dynamic econometric model similar to those used in empirical growth studies better fits the theoretical hypothesis that the short and long run adjustment costs, associated with reallocation of labor in reaction to trade changes, are different. The consideration of a dynamic empirical model was already considered by Greenaway et al. (1999). This author used the GMM-DIF estimator whereas this paper applies the GMM system estimator (GMM-SYS) developed by Blundell and Bond (1988, 2000). The paper also uses different explanatory variables and considers that the trade flows are not exogenous. The remainder of paper is organized as follows. Section 2 presents the theoretical background and the revisited empirical work on labor market responses to trade structure. Section 3 presents the employment equation. Section 4 presents the measuring of IIT and marginal IIT. Section 5 presents the econometric model. Section 6 analyzes the estimation results. The final section concludes.

## **II. Theoretical Background and Empirical Work**

The adjustment costs in the labor market arise from temporary inefficiencies, wage rigidity, innovation and technical progress. The increased imports are also associated with employment reductions. The technological changes affects IIT industries and non-IIT industries. The labor market theories suggest we have temporary unemployment, but in the long-run the economy return to the equilibrium. In the short term there are labor adjustment costs due to heterogeneity and product specificity of some factors, downward rigidity of nominal wages, market imperfections and trade induced adjustment costs.

The neoclassical trade theory considers that the long term gains from trade always outweigh the short term labor adjustment costs. There is a positive sum game and in the end the gains are large enough to compensate the losers. In the Heckscher-Ohlin (HO) model the free trade has as consequence a redistribution of employment from the import substitute industry to the export industry. The HO framework (traditional HO theory and specific factors theory that considers that labor is not specific) assumes that inter-industry labor movements are free and that there is no cost adjustment. The labor economists do not agree with this idea and consider that there are short-run adjustment costs, in terms of lost production, unemployment and reduced wages. Furthermore, the trade off between the gains of trade liberalization and short-term labor adjustment costs depends on the

labors skills. There are specific skills necessary to the industry and the inter-industry labor reallocation implies a loss of these skills and a short adjustment cost. However if the labor movements occurs within the same industry the labor adjustment cost will be less costly. These arguments led to a smooth adjustment hypothesis (SAH) formulated by the trade economists: if we assume that labor is not a homogeneous factor and has some degree of industry specificity, the adjustment cost will be less for IIT labor reallocation than for inter-industry one. Or, the labor-market adjustment costs in the form of unemployed labor will be lower if trade expansion is intra-industry rather than inter-industry in nature. The theoretical basis for this hypothesis is the Jones (1971) specific-factors model and the new trade theory that originated the IIT models ( See, for example, Krugman, 1979, 1980, 1981; Lancaster, 1980; Helpman and Krugman, 1985).

There are no general equilibrium model that integrates labor adjustment costs, specific industry factors and IIT theory. However, there is a theoretical consensus which considers that the trade and specialization patterns are linked and that changes of industry specialization motivated by increasing IIT implies low adjustment costs. The underlying assumption is that the goods are produced with the same factor proportions and the mobility of labor within the same industries is easier than the mobility of labor between different industries (see, for example, Balassa 1966; Krugman 1981, 1991; Greenaway et al., 1999; Brulhart 2000; Brulhart et al., 2006; Elliot and Lindley, 2006 ).

The other two problems problem associated with the SAH are: (i) the adequate indicator of labor adjustment costs; (ii) the exogenous or endogenous condition of trade variables. Some empirical studies uses the industry employment change as an inverse proxy for adjustment costs (Brulhart and Elliot 1998; Grenaway et al., 1999). Others studies utilize the index for intra-industry job turnover as defined by Davis and Haltiwanger (1992) (see, for example, Brulhart, 2000; Brulhart et al., 2004) and the more recent analysis use data on individual workers moves ( Brulhart et al., 2006; Elliot and Lindley, 2006; Cabral and Silva, 2006). The tests of the SAH usually consider trade variables as exogenous. This paper will consider that the trade flows are not exogenous and will employ the industry employment change as dependent variable.

### **III. Employment Equation**

The production function for the industry  $i$  in the period  $t$  can be represented as follows :

$$Q_{it} = AF(K_{it}, N_{it}) \tag{1}$$

Where:  $Q$ =real output

A= level of technology

K=capital stock

N= units of labor

We will consider a Cobb-Douglas production function for the representative firm in industry i in period t:

$$Q_{it} = A^\gamma F(K_{it}^\theta, N_{it}^{1-\theta}) \quad (2)$$

Where  $(1-\theta)$  and  $\theta$  represents the share of each factor in the real output (factor share coefficients) and  $\gamma$  allows for factors changing the efficiency of the production process.

The conditions of profit maximization will set that the firm will employ labor and capital that satisfies the following conditions : (i) the marginal revenue of labor equals the wage (w); (ii) the marginal revenue of capital equals its price (c). Solving the system we obtain:

$$Q_{it} = A^\gamma \left( \frac{\theta N_{it}}{1-\theta} \frac{w}{c} \right) N_{it}^{1-\theta} \quad (3)$$

Taking logarithms and rearranging equation (3) allows to derive the firm's, and therefore the industry's, derived demand for labour as:

$$\ln N_{it} = -\gamma \ln A - \theta \ln \left( \frac{w}{c} \right) + \ln Q_{it} \quad (4)$$

The dynamics in the employment equation can be introduced by considering a lag on employment into the employment equation. As Greenaway et al. (1999:492) pointed out: "Purely specifying dynamics in terms of lags of the dependent variable implicitly imposes a common evolution for employment following a change in an explanatory variable. This restriction may be relaxed by additionally introducing a distributed lag structure for the independent variables". We also adopt this explanation because we do not know the sources of the dynamics process in the employment equation. We only know that the level of employment change when the adjustment to equilibrium takes place.

The labor demand also depends on the volume of trade.<sup>2</sup> According to Heckscher-Ohlin-Vanek (HOV) theorem there is a threefold relationship between factor endowments, factor proportions and trade and it if the country is relatively labor-abundant (as is the Portugal case) the increasing exports (imports) will have a positive ( negative ) effect on

employment. In the context of HOV inter-industry trade framework there is a redistribution of the employment from the import substitute sector to the export sector, where the country has the comparative advantage. However, when we consider the intra-industry trade (IIT) the explanations given by the new trade theory are different (see, for example, Krugman 1979, 1980, 1981, Lancaster 1980, Helpman and Krugman 1985). The IIT is not homogeneous and we have horizontal IIT (HIIT) and vertical IIT (VIIT) types. The HIIT is mainly determined by scale economies, product differentiation and market structure whereas VIIT can be explained by Ricardo and HOV traditional trade theories (see, Helpman and Krugman 1985, Flam and Helpman 1987, Davis 1995). What happened to labor reallocation when the IIT increases? We may consider the HOV factor content theory to explain the effects of trade on employment. In this case both imports and exports have a specific “factor content” and the impact on employment is not high if this factor content of both flows is similar. Furthermore, if the labor reallocation occurs within the same industry the adjustment costs are minor.

This methodology is adequate if the countries partners have a similar level of development ( or if the relative factor endowments are not very different), but underestimate the employment impact of trade between developed and developing countries (see, Krugman, 1995; Greenaway et al., 1999). Alternatively, we may follow the growth accounting approach. In this last methodology the labor productivity growth is, in the short run, the main factor that explains the job losses. The trade factors, like exports, imports or IIT, have a small impact on employment. This paper do not distinguishes between HIIT and VIIT types and it assumes that: (i) following the factor content approach or the growth approach, there is a relationship between IIT and the employment changes ; (ii) labor should in general move more easily within than between industries; (iii) the trade flows are not exogenous: they depend of the level of technology and factor endowments; (iv) there are other potential sources of adjustment costs as nominal wage rigidity and imperfect substitutability of labor between sectors and this must be considered in the econometric model, as control variables.; (v) for the purposes of estimation the employment equation is differenced in order to obtain a dynamic regression equation. As the lagged independent variable enters in the regression equation as explanatory variable and there are other endogenous variables we need to use an instrumental variable approach like GMM system estimator.

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<sup>2</sup> Greenaway et al. (1999) considered that the technical efficiency is correlated with trade changes and introduced in this way the exports and imports into the employment equation. They also apply the logarithms and differences to obtain a dynamic employment equation.

#### IV. Measuring Intra-Industry Trade and Marginal Intra-Industry Trade

##### *Traditional intra-industry trade index*

The empirical literature use the index proposed by Grubel and Lloyd (1975). The Grubel and Lloyd (1975) index is given by:

$$B_i = 1 - \frac{|X_i - M_i|}{(X_i + M_i)}$$

where  $X_i$  and  $M_i$  are the exports and imports of a particular industry  $i$  in a given year . The index is equal to 1 if all trade is IIT. If  $B_i$  is equal 0 all trade is inter-industry trade. The Grubel and Lloyd index is a static measure and as Hamilton and Kniest (1991) demonstrated the changes of this index over time do not adequately reflects the changes in trade pattern. Hamilton and Kniest (1991) proposed a new index , but their measure did not eliminate the scale effect. For other words, their index did not allow the comparison between industries of different size. This problem was resolved by the Brulhart ( 1994) marginal IIT index (MIIT).

##### *Marginal intra-industry trade index*

$$MIIT = 1 - \frac{|(X_t - X_{t-n}) - (M_t - M_{t-n})|}{|X_t - X_{t-n}| + |M_t - M_{t-n}|}$$

This index could be rewritten in the following manner:

$$MIIT = 1 - \frac{|\Delta X - \Delta M|}{|\Delta X| + |\Delta M|}$$

The Brulhart index is a transformation of Grubel and Lloyd (1975) index. The MIIT index also takes the values between 0 and 1. The value 0 indicates that the marginal trade in the industry is exclusively of the inter-industry type, and the value 1 represents that the marginal trade is entirely of the intra-industry.

#### V. Econometric Model

The econometric equation must comprise three elements: (i) a dependent variable proxy for adjustment costs; (ii) independent variables for trade: marginal intra-industry trade,



exports and imports; (iii) a set of other explanatory variables to control for other influences on the dependent variable.

The dynamic nature of the adjustment process indicates to the theory a dynamic regression equation. We specified three different equations with different control variables and some differences in the lag structure.

#### *Dependent variable*

The dependent variable used is the change in total employment in Portuguese manufacturing industries. Most empirical studies use percentage employment changes as an inverse proxy for adjustment costs. This proxy does not take into account the labor movements due to wage differences. So, we introduced wages as explanatory variable to control for these effects.

The source used for dependent variable was Portuguese Ministry of Labor.

#### *Explanatory variables and expected sign*

There are multiple determinants of the employment changes. In this paper was considered the following explanatory variables:

- Lagged Employment ( $N_{t-j}$ ). It is the employment in the years before. It is expected a positive coefficient of this variable (see Greenaway et al. 1999);
- Real wages ( $W$ ). It is expected that the coefficient of this variable has a negative sign. (Greenaway et al. 1999);
- Real output ( $Q$ ). According to the literature the expected sign is positive;
- $M$  and  $X$ , are the imports and exports. The expected sign should be negative for imports and positive for exports (see, Greenaway et al. 1999);
- The average real wages in total imports ( $WM$ ) and the average real wages in total exports ( $WX$ ) were introduced to control for the openness trade. The more open an economy, the more it is expected IIT to matter. The expected sign is negative for import penetration and positive for export promotion (Greenaway et al. 1999);
- MIIT (Marginal Intra-Industry Trade). For this variable it is expected a positive effect on the dependent variable ( see, Brulhart and Elliot, 1998; Brulhart, 2000);
- Productivity ( $Prod$ ). According to the economic theory, the expected sign is negative;
- CONC (Industrial Concentration). This index is the ratio of the four largest firms sales relatively to total sales plus imports of industry. The expected sign is negative, because the high concentrated industries have a low intra-industry labor reallocation ( Brulhart et al. 2004);

-MES (Minimum Efficient Scale) We use the value added by the four main firms, as a variable proxy. If we consider the hypothesis of a small number of firms, the expected sign is negative, because scale economies can reduce the factor demands from this industry and promote inter-industry labor reallocation ;

- K/L (Intensity of Physical Capital). The variable proxy is the ratio between the non-salaried returns and the total employment of industry (see Hirsch 1974). The expected sign is negative;

- HC (Human Capital). The variable proxy is the absolute difference between salaries and medium salary of non-qualified workers, divided by the opportunity cost of capital (Cf. Branson and Monoyios 1977). The expected sign is a matter of empirical evidence. However, if we consider that HC is a specific factor (specific factors model) one may expect a relatively low employment reallocation and in this case the effect on employment changes is negative or not significant.

The data for the explanatory variables are sourced from INE-National Institute of Statistics, Bank of Portugal and Ministry of Labor.

#### *Model specification*

$$\Delta N_{it} = \beta_1 \Delta N_{i,t-j} + \beta_2 \Delta X_{it} - \beta_3 \Delta X_{i,t-j} + \beta_4 MIIT_{it} + \beta_5 MIIT_{i,t-j} + \delta t + \eta_i + \varepsilon_{it}$$

Where  $N_{it}$  is the total employment in industry  $i$  in time  $t$ .  $\Delta$  stands for the difference between years  $t$  and  $t-n$ .  $X$  is the vector of explanatory variables, excluding MIIT. All variables are in logs except MIIT.  $\eta_i$  is the unobserved time-invariant country-specific effects;  $\delta t$  captures a common deterministic trend.  $\varepsilon_{it}$  is a random disturbance assumed to be normal, independent and identical distributed (IID) with  $E(\varepsilon_{it}) = 0$  and  $Var(\varepsilon_{it}) = \sigma^2 > 0$ .

## **VI. Estimation Results**

The results of the estimations are presented in table 1 and we may note that the instruments are not correlated with the residuals and there is no second order serial correlation. So, the dynamic models are valid.<sup>3</sup>

In all equations the independent variable MIIT is statistically significant and has the predicted negative sign. The SAH that intra-industry adjustment is costless is not confirmed by the empirical results for Portuguese industry. At least there is no positive

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<sup>3</sup> The equations will give consistent estimates if there is no second-order serial correlation.

correlation between MIIT and employment changes. However when we consider the lags of this variable the coefficients are always positive and the two-year lag has a bigger effect than a one-year effect. The data suggest that the intra-industry trade adjustment imposes reallocation labor costs in the same year (contemporaneous effect), but over a long term this effect change and the pressure for factor reallocation is decreasing. So the effects of intra-industry trade changes on labor market depend crucially of time period lags. In we add the coefficient of the contemporaneous variable (MIIT) with the coefficients of the lagged variables (MIIT  $t-1$  and MIIT  $t-2$ ) the SAH hypothesis is confirmed in the equations (2), but not in equation (1) and (3), although in equation (1) we only considered one-year lag. The results suggest us that if we consider further time-lags and/or other dependent variable the results may be quite different . The shortcoming of these econometric attempts arises from a lack of a formal model that relates adjustment labor costs and its trade and non trade determinants.

There are other results that we ought to note. The lagged dependent variable presents a positive and significant expected sign in all equations and for one- year and two-year lags. These results indicate persistence effects. As expected, the employment answers negatively to wages and productivity. In equation (2) the growth of imports (exports) relates to negatively (positively) to employment changes as expected. In the same way the import penetration (measured by WM) and the export promotion (WX) have also the expected sign, but they are not statistically significant. In the equation (3) the increasing in industrial concentration has a predicted negative effect on employment changes and this negative effect is persistent in time lags, but in equation (1) the growth in industrial concentration has a positive effect. We ought to that the econometric specifications are different which may explain these contradictory results. In equation (1) the intensity in physical capital has a wrong positive sign, but it is not significant. This variable lagged  $t-1$  and  $t-2$  has a negative effect on employment changes as was expected.

For the variable human capital the expect sign is negative, or not different from zero and the contemporaneous effect is negative, but not significant.

Table 1: Employment Equations

Variables	(1)	(2)	Variables	(3)
$\Delta \text{Log } N_{t-1}$	0.295 (2.15)**	0.300 (3.42)***	$\Delta N_{t-1}$	0.239 (4.38)***
$\Delta \text{Log } N_{t-2}$	0.362 (2.74)***	0.192 (1.85)*	$\Delta N_{t-2}$	0.497 (2.11)**
$\Delta \text{Log } W$	-0.135 (-3.41)***	-0.030 (-0.713)	$\Delta \text{Prod}$	-23.824 (-1.34)
$\Delta \text{Log } W_{t-1}$	0.135 (3.40)***	0.063 (146)	$\Delta \text{Prod}_{t-1}$	-0.033 (-0.016)
$\Delta \text{Log } W_{t-2}$	-0.080 (-1.73)*	-0.040 (-1.37)	$\Delta \text{Prod}_{t-2}$	-2.274 (-2.00)**
$\Delta \text{Log } Q$	0.074 (0.727)	0.160 (1.96)**		
$\Delta \text{Log } Q_{t-1}$	-0.114 (-1.02)	0.015 (0.138)		
$\Delta \text{Log } Q_{t-2}$	0.023 (0.219)			
MIIT	-1.013 (-3.50)***	-0.517 (-1.75)*	MIIT	-2548.75 (-1.97)**
MIIT <sub>t-1</sub>	0.461 (1.22)	0.159 (0.375)	MIIT <sub>t-1</sub>	132.506 (0.112)
MIIT <sub>t-2</sub>		0.898 (2.46)**	MIIT <sub>t-2</sub>	1646.50 (1.12)
$\Delta \text{Log } \text{CONC}$	0.28 (3.10)***		$\Delta \text{CONC}$	-7648.82 (-1.64)
$\Delta \text{Log } \text{CONC}_{t-1}$	-0.059 (-0.472)		$\Delta \text{CONC}_{t-1}$	-6542.07 (-1.82)*
$\Delta \text{Log } \text{CONC}_{t-2}$	-0.056 (-0.56)		$\Delta \text{CONC}_{t-2}$	-6548.22 (-1.92)*
$\Delta \text{Log } K/L$	0.590 (1.32)		$\Delta \text{MES}$	-167.380 (-0.292)
$\Delta \text{Log } K/L_{t-1}$	-1.445 (-3.07)***		$\Delta \text{MES}_{t-1}$	205.300 (-1.25)
$\Delta \text{Log } K/L_{t-2}$	-0.227 (-0.443)			
$\Delta \text{Log } \text{HC}$	-0.404 (-1.16)			
$\Delta \text{Log } \text{HC}_{t-1}$	0.289 (0.679)			
$\Delta \text{Log } \text{HC}_{t-2}$	0.301 (0.708)			
$\Delta \text{Log } X$		0.104 (1.33)		
$\Delta \text{Log } X_{t-1}$		0.009 (0.147)		
$\Delta \text{Log } X_{t-2}$		0.093 (1.85)*		
$\Delta \text{Log } M$		-0.018 (-0.375)		
$\Delta \text{Log } M_{t-1}$		-0.077 (-1.83)*		
$\Delta \text{Log } M_{t-2}$		0.014 (0.234)		
$\Delta \text{Log } WX$		0.073 (1.43)		
$\Delta \text{Log } WX_{t-1}$		0.072 (2.12)**		
$\Delta \text{Log } WX_{t-2}$		0.053 (1.49)		
$\Delta \text{Log } WM$		-0.049 (-1.08)		
$\Delta \text{Log } WM_{t-1}$		-0.013 (-0.87)		
$\Delta \text{Log } WM_{t-2}$		0.053 (1.49)		
C	3.453 (3.45)	-0.870 (-0.363)		280.9 (1.47)
M1	-1.583 [0.113]	-0.427 [0.669]		-1.225 [0.221]
M2	0.7092 [0.478]	-0.6143 [0.539]		-0.054 [0.957]
WJs	10.40 [0.000]	126.0 [0.000]		707.8 [0.000]
Sargan	2.164 [1.000]	1.417 [1.000]		5.796 [1.000]
Observations	110	110		110

The hypothesis that each coefficient is equal to zero is tested using one-step robust standard error. T-statistics (heteroskedasticity corrected) are in round brackets. \*\*\*/\*\*/\*- statistically significant, respectively at the 1%,5% and 10% level. P-values are in square brackets. Year dummies are included in all specifications (this is equivalent to transforming the variables into deviations from time means, i.e the mean across the  $n$  industries for each period).

$M_1$  and  $M_2$  are tests for first-order and second-order serial correlation in the first-differenced residuals, asymptotically distributed as  $N(0,1)$  under the null hypothesis of no serial correlation (based on the efficient two-step GMM estimator).  $W_{JS}$  is the Wald statistic of joint significance of independent variables (for first-steps, excluding time dummies and the constant term). Sargan is a test of the over-identifying restrictions, asymptotically distributed as  $\chi^2$  under the null of instruments' validity (with two-step estimator). The equations will give consistent estimates if there is no second-order serial correlation.

The instruments in levels used are: LogN (2,6), LogW (2,6),LogQ (2,6) for first differences. For levels equations, the instruments used are first differences of all variables lagged t-1.

VII. Conclusion

## VII. Conclusion

In this paper, we estimate the effects of trade and marginal intra-industry trade on labor-market changes in Portugal manufacturing industries during the period 1996-2003, controlling for the effects of the other variables. Our results give indications that do not support the SAH. For all three equations the MIIT index has a negative and statistically significant coefficient. However, with one or two-year lags the negative effects of the marginal intra-industry trade (MIIT) on industry employment changes do not persist and become positive. In synthesis and considering the three dynamic equations, the results suggest that only lagged MIIT measures related positively to labor reallocation in the sense of the SAH. What about other trade variables? The contemporaneous effects of exports (imports) variables have the correct positive (negative) sign, although only some of the lagged variables are statistically significant. Other conclusion we ought to note is that the negative effect of MIIT on employment changes reinforces the effect of import penetration and offsets the exports positive effect. In terms of control variables the wage and productivity variables, with and without lags, have always the expected negative sign. The industrial concentration index has nearly always the negative predicted sign. Given these results and comparing them with other empirical studies, we conjecture that the selection of the adjustment cost indicator and the model specification are crucial to accept or refuse the SAH.

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