Measuring the effect of globalization on labour demand elasticity: An empirical application to OECD countries

Giovanni S.F. Bruno[+], **Anna M. Falzoni**[§+]

and Rodolfo Helg[*+*]

[+]Università Bocconi, Milano

[§]Università di Bergamo

[*]LIUC - Università Carlo Cattaneo

Preliminary version: July 31, 2001.

Abstract

There are various paths through which globalization is channelled to the labour market. One of these is the effect on labour demand elasticity. Trade might induce an increase in this elasticity via a scale effect due to the increased competition on the output market and/or via a substitution effect generated by expanding the firm production possibility set to include additional inputs. The focus of this paper is centered on the latter channel of transmission. A labour demand equation is obtained from the solution of a firm's cost minimization problem. The impact of globalization on domestic employment is not restricted to a wage elasticity effect, but also allows for a direct effect with globalization acting as a domestic labour demand shifter. A theoretically consistent labour demand is estimated using a industry-year panel from a number of industrialised countries, including major European countries, Japan and the US over the period 1970-96. Overall we do not find any significant substitution effect of trade on labour demand elasticity. The only exception is France.

[*]We thank Alessandra Palmieri for superb research assistance.

1. Introduction

In the recent debate on the effects of increasing international integration on the labour market, most of the attention has been devoted to evaluate the impact of trade on wages and employment. However, there might be other paths through which globalisation influences the labour market. One of these is the effect on labour demand elasticity. Dani Rodrik, in his book "*Has globalisation gone too far?*"(1997), was among the firsts to emphasize the link between openness and labour demand elasticity and to suggest that a higher responsiveness of labour demand to changes in labour prices might be a direct consequence of international economic integration "regardless of economic structure and the identity of the trade partners" (Rodrik, 1997, 26).

It is well known that total own-price labour demand elasticity is composed of two parts (Hamermesh, 1993): 1) the *scale effect*, which explains the employment variation due to the wage-induced change in the demanded output; and 2) the *substitution effect*, which explains the employment variation due to substitution toward other inputs for constant output. In this context, trade might theoretically influence the total own-price labour demand elasticity via the scale effect due to the increased competition on the output market and/or via the substitution effect generated by modifying the firm production possibility set to include new foreign and domestic inputs, or to increase the efficiency of the existing ones.

In this paper we centre our attention on the measurement of constant output own-price labour demand elasticity, evaluating, on the one hand, the direction of the globalisation impact on these elasticities, and, on the other hand, uncovering what variation in the isoquant mapping underlies such an impact.

What are the channels through which globalisation might influence the isoquant mapping? Greater international openness enables firms to employ a larger variety of intermediate products and capital equipment, produced both domestically and abroad, and potentially to directly substitute foreign to domestic factors of production. Furthermore, in an economy that is more open to foreign trade and investment, increased "familiarity" - that is a reduction in informational barriers to trade (Rauch and Trindade, 2000) - can expand business opportunities and make international transactions easier. In addition, trade may be a vehicle for technological spillovers, through both the import of goods embodying foreign knowledge and/or the acquisition of useful information that would be otherwise costly to obtain (Coe and Helpman, 1995). All these factors contribute to expand the business and technological opportunities of the firm, enhancing not only the substitutability among factors of production, but also technical efficiency.

We develop a general framework to testing the impact of globalisation on labour demand elasticities, as well as on technical efficiency. To do this a trade variable is included in the specification for the labour demand equation, both in interaction with the relative wage and alone as a demand shifter. The labour demand equation is obtained from the solution of a firm's cost minimization problem. This model is estimated using an industry-year panel for a number of industrialized countries, including major European countries, Japan and the US over the period 1970-96. Employment adjustment costs are accommodated by estimating a dynamic specification. Moreover, to estimate a globalisation effect free of technical change bias, we also include a time trend.

Overall we do not find any significant effect of trade on labour demand elasticity. The only exception is France. Our results seem to confirm, on a more general ground, the findings of Slaughter (2001) for the US and of Greenaway et al. (1999) for the U.K. An increasing elasticity over time in absolute term for all sectors is observed for Germany, the UK and the US and decreasing for Italy, Japan and Spain. A mixed picture is offered by France in which for only a subset of sectors (transport, traditional and chemical) the elasticity increases in absolute value.

The structure of the paper is as follows. Section 2 reviews the related literature. Section 3 sets up the empirical model. The estimation strategy is presented in Section 4. Section 5 describes the data. Results are reported and discussed in Section 6.

2. Related literature

Under the pressure of the public debate on increasing competition from low wage countries, the empirical literature has primarily focused on the effects of greater international integration on relative factor prices and employment, failing however to achieve a consensus on its role (Pflüger, 2001). Differently, less attention has been devoted toan additional channel through which increasing international openness can affect the labour market: via labour demand elasticity changes. From a theoretical point of view, Panagariya (1999) shows that the Rodrik's conjecture of a positive effect of globalisation on labour demand elasticity is not a general result. As a consequence, the validity of that relationship has to be determined empirically.

Slaughter (2001), adopting a two-stage approach on an industry-year panel from 1961 through 1991 for the United States, provides mixed support to the view that trade contributed to increased elasticities. In the first stage, Slaughter finds that demand for production labour has become more elastic in manufacturing overall and in five of eight industries within manufacturing; the same is not true for non-production labour. In the second stage, when estimated elasticities are regressed on a set of trade variables and industry dummies are included, Slaughter finds many significant coefficients, with the expected sign. However, in a number of cases, these predicted effects disappear when time dummies are introduced. For production workers as well as for non production workers, time results to be a very strong predictor of elasticity pattern. In sum, there appears to be a large unexplained residual for changing factor demand elasticities.

Applying a similar methodology, Faini *et al.* (1999) find some support to the hypothesis that greater globalisation is associated with larger elasticities for Italy during the period 1985-1995. In particular, the correlation coefficients between the estimated sectorial elasticities and the measures of international integration are higher and more significant when globalisation is measured with the share of employees in foreign affiliates rather than with the degree of trade openness.

The experience of dramatic changes in trade regimes in a number of developing countries might be thought as the appropriate context to investigate the theoretical link between openness and labour demand elasticities. This approach is in fact been followed by Krishna *et al.* (2001) and Fajnzylber and Maloney (2001), finding however no support to the conjecture of more-elastic labour demand in response to trade liberalization. Using Turkish plant-level data, Krishna *et al.* (2001) estimates a labour demand equation in which the wage variable is interacted with a liberalization dummy, capturing the effect of changes in trade policy. Overall, the results show that labour demand elasticities seem to be unresponsive to openness. Only very mixed support and no consistent patterns for the idea that trade liberalization has an impact on own wage elasticities also emerges in the study by Fajnzylber and Maloney (2001). They use dynamic panel techniques to estimate labour demand functions for manufacturing establishments in Chile, Colombia and Mexico.

Focusing on the intersectoral dimension of the *scale effect*, Jean (2000) studies the impact of trade openness on the price-elasticity of aggregate labour demand. The idea developed by Jean is that an increase in the cost of a given type of labour has an effect on the sectorial trade specialization of an economy, at the expense of the domestic production using this factor intensively. As this effect is more important the more open the economy, trade openness induces an increase in the associated labour demand elasticity, at least if the country has a comparative disadvantage in the industries using intensively the factor considered. Jean shows that, for France, trade openness can indeed have a significant effect on labour demand elasticities through this mechanism.

Finally, in a paper close to ours in many aspects, Greenaway *et al.* (1999) try to evaluate the impact of trade volumes on employment through induced productivity changes. Adopting a dynamic labour demand framework for the UK, they find that increases in trade volumes, both in terms of imports and exports, cause reductions in the level of derived labour demand, consistently with the view that increased openness serves to increase the efficiency with which labour is utilized in the firm. Greenaway *et al.* attempt also to analyse the impact of trade changes on the slope of the derived labour demand introducing a term corresponding to interactions between the wage rate and import and export volumes. They find a positive effect of trade volumes on the labour demand elasticity but this impact is not significant.

3. The Model

The theoretical model on which we will base our empirical analysis is very simple. We maintain the existence of a representative firm for each sector of the economy. There are two domestic production inputs, domestic labour l and capital k producing output y, with ω and p being the compensations for l and k, respectively. Normalizing by p, the relative compensation for domestic labour is $w = \omega/p$. The market for production factors is perfectly competitive, whereas no assumption is made on the form of the output market.

Trade activity g is the key factor of the model. We allow for g to play a role in expanding the domestic production possibility set of the firm. International trade might exercise an impact on the production possibility set by bringing with it new production techniques and inputs that were previously unknown, or not accessible, to the firm. Also, trade might enhance the productivity of the existing inputs by bringing into bear new immaterial inputs, such as new foreign knowledge and the acquisition of useful information, or simply by acting as a yardstick of competition for the existing domestic employment, inducing more effort on the workplace. Overall these forces may influence labour own price elasticity, as well as bring about a direct effect on labour demand, with g acting as a demand shifter.

The timing of firm decisions is as follows. At stage 1, upon observing relative price w and a number of other relevant exogenous variables x, the firm chooses the degree of openness to the global market g and the level of production y. We do not assume anything on the cost of international openness, as well as on the optimality of output and openness decisions. At stage 2 the firm observes an idiosyncratic productivity shock ϵ, such that $E(\epsilon|w,x) = 0$, and chooses the domestic factor demands to minimize its cost $wl + k$ conditional on g and y, chosen at the previous stage, and on w and x. Under these hypotheses, we have $E(\epsilon|w,x,g,y) = 0$.

Since the focus of our analysis lays on domestic labour demand, we start directly with an adequate specification of the latter, postponing the derivation of the underlying production function to the next section. We specify the domestic labour demand as follows

$$\ln l = \beta_o + \left(\beta_w + \beta_{wg} \ln g\right) \ln w + \beta_y \ln y + \beta_g \ln g + \beta_x \ln x + \epsilon, \tag{3.1}$$

where β_o, β_y, β_w, β_{wg}, β_g and $\beta_x$are constant parameters. The parameter β_g measures the impact of g as a demand shifter, whereas β_{wg} measures the impact of g on the relative wage elasticity of the labour demand function, which is given by

$$\varepsilon_{lw} \equiv \frac{\partial \ln l}{\partial \ln w} = \beta_w + \beta_{wg} \ln g. \tag{3.2}$$

For equation (3.1) to be theoretically consistent with cost minimizing behaviour and a non decreasing production function, it must be $\varepsilon_{lw} \in [-1, 0]$.

Finally, since we wish to allow for the production process to go through even with no significant trade activity, we normalize the globalisation variable g so that $g \geq 1$.

3.1. Recovering the Production Function

The question arises about what technology underlies the domestic labour demand equation (3.1). Recovering the production function from (3.1) is worked out into two steps. First, the cost function generating (3.1) is recovered by integrating (3.1). Second, the production function is obtained from the cost function by duality.

The first step is straightforward. From Shephard's Lemma and (3.1) we have

$$\frac{\partial C}{\partial w} = l = e^{\beta_o + \epsilon} y^{\beta_y} x^{\beta_x} g^{\beta_g} w^{\beta_w + \beta_{wg} \ln g},$$

and so the (normalized) cost function must have the following restricted translog form:

$$C = \int_0^w e^{\beta_o+\epsilon} y^{\beta_y} x^{\beta_x} g^{\beta_g} t^{\beta_w+\beta_{wg}\ln g} dt = \frac{e^{\beta_o+\epsilon} y^{\beta_y} x^{\beta_x} g^{\beta_g}}{\beta_w + \beta_{wg}\ln g + 1} w^{\beta_w+\beta_{wg}\ln g+1}. \tag{3.3}$$

It is a restricted form in that the interaction term between output and wage and the squared wage do not enter the cost function specification.

The second step goes as follows. Singling out w in

$$l = e^{\beta_o+\epsilon} y^{\beta_y} x^{\beta_x} g^{\beta_g} w^{\beta_w+\beta_{wg}\ln g}.$$

yields

$$w = \left(\frac{l}{e^{\beta_o+\epsilon} y^{\beta_y} x^{\beta_x} g^{\beta_g}}\right)^{1/(\beta_w+\beta_{wg}\ln g)}. \tag{3.4}$$

Since C is a normalized cost function, we can write

$$C = wl + k. \tag{3.5}$$

Thus, substituting for C from (3.3) and for w from (3.4) into (3.5) gives

$$\left(\frac{l}{e^{\beta_o+\epsilon} y^{\beta_y} x^{\beta_x} g^{\beta_g}}\right)^{1/(\beta_w+\beta_{wg}\ln g)} l + k = \frac{e^{\beta_o+\epsilon} y^{\beta_y} x^{\beta_x} g^{\beta_g}}{\beta_w + \beta_{wg}\ln g + 1} \left(\frac{l}{e^{\beta_o+\epsilon} y^{\beta_y} x^{\beta_x} g^{\beta_g}}\right)^{1+\frac{1}{\beta_w+\beta_{wg}\ln g}}, \tag{3.6}$$

which, after rearrangement and substituting for $\beta_w + \beta_{wg}\ln g$ from (3.2), gives the desidered production function.

$$y = \left(\frac{1}{e^{\beta_o+\epsilon} x^{\beta_x} g^{\beta_g}}\right)^{\frac{1}{\beta_y}} \left(\frac{-\varepsilon_{lw}}{1+\varepsilon_{lw}}\right)^{\frac{\varepsilon_{lw}}{\beta_y}} (k)^{-\frac{\varepsilon_{lw}}{\beta_y}} (l)^{\frac{1+\varepsilon_{lw}}{\beta_y}}. \tag{3.7}$$

The resulting production function is homothetic of degree $1/\beta_y$ and has a restricted translog form, with a variable technical efficiency given by

$$A = \left(\frac{1}{e^{\beta_o+\epsilon} x^{\beta_x} g^{\beta_g}}\right)^{\frac{1}{\beta_y}} \left(\frac{-\varepsilon_{lw}}{1+\varepsilon_{lw}}\right)^{\frac{\varepsilon_{lw}}{\beta_y}}. \tag{3.8}$$

A depends on g, x, the stochastic shock ϵ, and labour demand elasticity ε_{lw}. If $\beta_{wg} = 0$, then A reduces to the expression for technical efficiency in Greenaway et al. (1999).

By taking equation (3.8) in logarithms and then differentiating it with respect to $\ln g$, we obtain the elasticity of A with respect to g

$$\varepsilon_{Ag} = -\frac{\beta_g}{\beta_y} + \frac{\beta_{wg}}{\beta_y}\left[\ln\left(\frac{-\varepsilon_{lw}}{\varepsilon_{lw}+1}\right) + \frac{1}{\varepsilon_{lw}+1}\right]. \tag{3.9}$$

In the Greenaway's case of $\beta_{wg} = 0$, ε_{Ag} reduces to the constant parameter $-\beta_g/\beta_y$, with g acting on the isoquant mapping as Hicks-neutral technical change. Thus, in our formulation (3.9) ε_{Ag} must be thought of as generalized technical efficiency effect. Unlike β_y and ε_{lw}, there are no theoretical restrictions on the sign of ε_{Ag}, which in turn depends on the sign of β_g and β_{wg} and the size and sign of ε_{lw}.

Notice that the presence of β_g ensures enough flexibility to cover all possible relevant economic instances. For example, should we restrict ourselves to $\beta_g = 0$, then in the presence of a negative impact of g on ε_{lw} ($\beta_{wg} \leq 0$), a positive impact of g on technical efficiency ($\varepsilon_{Ag} \geq 0$) would be possible only for $|\varepsilon_{lw}| \in [0, 1/2]$. On the other hand, if β_g is free to assume any value, then $\beta_{wg} \leq 0$ and $\varepsilon_{Ag} \geq 0$, as well as any other combination of signs, can be compatible with any plausible $|\varepsilon_{lw}|$.

The economic interpretation of β_g parallels that of β_w, in that β_g is the intercept of the labour elasticity with respect to g, in fact

$$\varepsilon_{\mathrm{lg}} \equiv \frac{\partial \ln l}{\partial \ln g} = \beta_g + \beta_{wg} \ln w.$$

As such, β_g measures the responsiveness of labour demand to g at $w = 1$, that is when the economic rate of substitution (w) is 1. Implementing empirically this model one can test the following hypotheses:

- · Rodrik's conjecture that $\beta_{wg} < 0$ (globalisation has a positive impact on $|\varepsilon_{lw}|$).

  · Generalized efficiency effect: $\varepsilon_{Ag} > 0$.

4. Estimation Strategy

Before explaining the estimation methods, we address a general identification problem typically arising in the estimation of equilibrium relationships. The model used to estimate the impact of globalisation on the elasticity of labour demand involves the estimation of the labour demand equation (3.1). In order to do so, the amount of labour engaged in production is regressed, in addition to other regressors, on a measure of the relative remuneration of labour. The coefficient on the latter is interpreted as a relative wage elasticity of labour demand . In theory, however, both labour demand and labour supply depend on relative wages. It is therefore not clear what combination of labour-demand and labour-supply elasticities is obtained using this procedure.

In order to overcome this problem, we make a similar assumption to that made explicitly by Slaughter (1997) and implicitly by Greenaway et al (1999), and Faini et al. (1998) . In particular, labour supplies are assumed to be perfectly elastic. In this way, shifts in the labour supply curve, as measured by movements in wages, are able to trace out the labour-demand curve (whose position is controlled for by the other regressors included in the model that are thought to leave the labour supply schedule unaffected). If this assumption holds, the coefficient on the relative wage may be interpreted as the elasticity of labour demand.

Our econometric model is based upon equation (3.1). Let N be the number of sectors and T the number of time periods for which the i.th sector is observed, $i = 1, ..., N$. We accommodate sector heterogeneity by allowing β_o to vary across sectors. This yields sector specific coefficients in equation (3.1), namely β_{o_i}, $i = 1, ..., N$. Thus, our empirical baseline equation modifies as follows

$$\ln l_{i,t} = \beta_{o_i} + \left(\beta_w + \beta_{wg} \ln g_{i,t}\right) \ln w_{i,t} + \beta_y \ln y_{i,t} + \beta_g \ln g_{i,t} + \beta_x \ln x_{i,t} + \epsilon_{i,t}, \quad (4.1)$$

$t = 1, ..., T$, $i = 1, ..., N$.

Equation (4.1) is static in nature and may be estimated by applying a standard one-way within estimator. As such, however, it fails to incorporate employment slow adjustment to changes in the relative wage in the presence of adjustment cost. This will be taken into account by including lags on employment into the baseline equation. For model parsimony's sake, we shall limit to specifications including the first lag, or the first two lags of $\ln l_{i,t}$. In the case of one lag, equation (4.1) modifies accordingly

$$\ln l_{i,t} = \beta_{o_i} + \gamma \ln l_{i,t-1} + \left(\beta_w + \beta_{wg} \ln g_{i,t}\right) \ln w_{i,t} + \beta_y \ln y_{i,t} + \beta_g \ln g_{i,t} + \beta_x \ln x_{i,t} + \epsilon_{i,t}, \quad (4.2)$$

$t = 1, ..., T$, $i = 1, ..., N$.

Finally, exploiting the panel structure of our data set, we can disentangle the labour market impact of increasing international integration from that of technical progress. The impact of technical progress is captured by appending a time trend $\ln t$, alone and interacted with $\ln w$, to both equations (4.1) and (4.2).

Turning to the estimation aspects, it is well known from the dynamic panel data literature that the standard within estimator applied to a first order autoregressive model yields consistent estimates only when the number of time periods T is large (Nickell (1981)), which is not the case for most panels, ours included. To solve such a problem, econometricians have suggested various instrumental variable approaches (Arellano and Bond (1991), Ahn and Schmidt (1995) among others). Here we follow the Generalized Method of Moment (GMM) estimator approach suggested by Arellano and Bond, widely used in most recent dynamic panel data applications, which exploits all available linear orthogonality conditions. The procedure goes as follows.

The individual effects are eliminated by taking system (4.2) in first differences:

$$\begin{aligned} \Delta \ln l_{i,t} &= \gamma \Delta \ln l_{i,t-1} + \beta_w \Delta \ln w_{i,t} + \beta_{wg} \Delta \left(\ln g_{i,t} \ln w_{i,t} \right) + & (4.3) \\ & \quad \beta_y \Delta \ln y_{i,t} + \beta_g \Delta \ln g_{i,t} + \beta_x \Delta \ln x_{i,t} + \Delta \epsilon_{i,t} & (4.4) \end{aligned}$$

$t = 1, ..., T_i$, $i = 1, ..., N$.

If Σ is such that the error terms are serially uncorrelated, the errors in first-differences may well exhibit MA(1) autocorrelation. An instrumental variable approach is then followed to estimate (4.3), with the instruments optimally weighted by the expected variance-covariance matrix of the orthogonality conditions, as required by an optimal GMM estimator.

The Arellano and Bond (AB) estimator has some distinctive advantages, as compared to other estimators. While it presents attractive asymptotic properties, it is also relatively easy to implement, and its performance in finite sample with N large is fairly good, as recent Monte Carlo evidence is able to show (Harris and Matyas, 2000). The same evidence, however, shows that the inconsistent LSDV estimators perform no worse than the AB estimator in finite sample with N small. In addition, Kiviet (1995, 1999) has recently proposed a bias corrected LSDV estimator, whose performance in terms of mean square errors has been investigated in the Monte Carlo study by Bun and Kiviet (2001) and found better than various GMM and IV estimators, when both T and N are small. For this reason, conscious of the small cross-sectional dimension of our panel, along with the AB estimator we also implement and report results from both the simple LSDV and the corrected LSDV (CLSDV) estimators applied to the dynamic equation (4.2).[1]

[1] All estimation work has been carried out in STATA, version 7, using the built-in commands -xtreg- for standard LSDV estimators and -xtabond- for the Arellano and Bond estimator. In

5. The data

The data used for the empirical work comes from the OECD STAN database (OECD, 1998).[2] The data set covers a panel of 40 manufacturing industries in the period 1970-1997. The industries are grouped using a standard ISIC Revision 2 classification; details concerning the industry description and the ISIC rev.2 code are given in Table A1 of the Appendix. Panel-balancing requirements for the regressions that have been carried out have meant that for each of the different countries considered some manufacturing industries have had to be eliminated due to the presence of only a limited number of observations present in the time series required. Table A2 in the Appendix specifies which sectors have been removed for which countries.

Table A3 of the Appendix provides definitions for the variables of the STAN database that have been used in the empirical implementation as given in the OECD STAN database manual, as well as the variable codes used in the regression analysis. Our dependent variable l is measured as "number engaged" (NE). The output variable y is proxied by Value Added in constant 1990 prices (VA90). Relative wage of domestic labour w is constructed as follows: 1) we obtain average remuneration of labour by taking the ratio of total labour cost to number engaged 2) we divide this variable by the price of capital p which is proxied by the value added deflator. As a proxy for international integration g , we utilize three different measures: 1) the share of import plus export over valued added. ($g1$), the share of import over value added ($g2$), and the share of foreign affiliate total sales over value added (gs) (measured only for the US. and Italy). Further details regarding the construction of these variables are given in Table A4.

6. Results

Tables 1 to 8 present our results. For each country we report estimates of equation (4.2) where in place of variable x we have introduced a time trend alone and its interaction with $\ln w$, both accounting for technical progress[3]. We allow for

addition, we have designed a STATA code performing the bias corrected CLSDV estimator, which is available on request.

[2] The STAN data set is constructed by the OECD, in collaboration with the Central Statistical Offices of OECD countries, with the aim of achieving a national account compatible database for all of the twenty-two OECD countries.

[3] A more general, but less parsimonius, specification with time dummy variables produces similar results.

industry heterogeneity with industry fixed effects. Results are reported for two different specifications of the globalisation variable (one with g1 and the other with g2) and for two different estimators: the within (LSDV) estimator and the one-stage Arellano-Bond (A-B) estimator (for a subset of countries we also computed the corrected LSDV (CLSDV) estimator). For all estimates we report the corresponding heteroschedatsic robust t or z statistic.

Overall, these estimates are statistically and economically satisfactory with all regularity conditions satisfied. The null hypothesis of no-second order correlation in the disturbances of the first-differenced equation (AB) cannot be rejected for all countries/specifications. Our dynamic framework allows the estimation both of short and long run constant output labour demand elasticities. For all countries but Germany we obtain plausible estimates. The mean value of the long run elasticity is for almost all countries within the range estimates of other studies surveyed by Hamermesh (2000) and is robust to changes in globalisation measurenment Considering eq 3 in part b) of the tables, the long run elasticity is low, in absolute term, for France (.22), Sweden (.33), Japan (.35). Higher values are obtained for the United Kingdom (.48), Spain (.54), Italy (.75), the US (.81). These estimates are also substantially robust to changes in the estimator adopted. The Kiviet's CLSDV estimates (not reported in the tables) of long run elasticity are for Italy and Spain, respectively, .84 and .57. Moreover, almost all point estimates for the various sectors/countries are negative.

What is the role of increasing international integration ? In our framework this effect can work on labour demand through two channels: the direct effect and the effect via elasticity. Increasing international integration has the Rodrik-expected elasticity augmenting effect only for France. It has the opposite effect for Japan (but this result is not robust to the change of the globalisation variable). In all remaining countries globalisation has not significantly affected labour demand elasticity. This result confirms, on the basis of a larger set of countries analysed within a common framework, those obtained by Slaughter (2001) for the US, by Greenaway et al. (1999) for the UK, by Krishna et al. (2001) for Turkey and Fajnzylber and Maloney (2001) for a group of Latin American less developed countries.

A significant direct positive effect of increasing international integration is found for Italy, France and, even if less robust, for the UK . For all other countries globalisation has no significant direct effect on compensated labour demand.

Figures 1a to 8a show the evolution over-time of the constant-output labour demand elasticity for the various sectors. A generalised negative trend over time (i.e. bigger elasticity in absolute value) is found for Germany, the UK and the US. A generalized positive trend overtime is found for Italy, Japan and Spain. For France and Sweden the evolution overtime is less homogeneous across sectors. In France, the only country for which we have found a negative impact of increasing international integration on labour demand elasticity, a negative trend is found for a group of traditional sectors (textiles, apparel, footwear), for the transport macro-sector (motorvehicles, motorcycles, airplanes, transport equipment), for the industrial chemical sector. By comparing Figure 1a to Figure 1b, in which we have reported the elasticity evolution due only to the globalisation variable[4], it is possible to conclude that the elasticity evolution over time for France is mainly driven by the globalisation variable rather than the time trend. For most other countries what drives the change in labour demand elasticity is the trend evolution rather than the globalisation variable[5].

7. Conclusions

The claim that increasing international integration affects labour demand elasticity doesn't receive strong support from our results for eight industrialized countries. Only for France we are able to find evidence for it. This result is substantially robust to changes in variable measurement and in the estimator adopted. Moreover, we have shown that not for all countries/sectors the estimated elasticity is increasing in absolute terms. These results are in line with those obtained by the recent literature on this issue. The innovative contribution of the paper is firstly, the theoretical framework in which the role of international integration is consistently introduced into a dynamic labour demand equation (avoiding a two-stage approach à la Slaughter). Secondly, this framework is utilised for a set of industrialised countries allowing coherent comparison of the results. Thirdly, particular attention has been devoted to the properties of the estimators adopted both with reference to consistency and to small sample properties.

[4] In the "a" set of figures the complete time evolution of labour demand elasticity is computed according to the formula:

$\varepsilon_{lw} \equiv \beta_w + \beta_{wg} \ln g + \beta_{wt} \ln t$

In the "b" set of figures the time evolution due to the globalisation variable is computed using only the first two terms on the right hand side of the formula.

[5] For the US this confirms Slaughter (2001) result.

References

[1] Ahn, S.C. and P. Schimdt, (1995), "Efficient Estimation of Models for Dynamic Panel Data", *Journal of Econometrics*, 68, 5-28.

[2] Arellano, M. and S. Bond, (1991), "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations", *Review of Economic Studies*, 58, 277-297.

[3] Bun, M.J.G. and J.F. Kiviet, (2001), "The accuracy of inference in small samples of dynamic data models", Tinbergen Institute D.P. 006/4.

[4] Coe, D. and E. Helpman, (1995), "International R&D spillovers", *European Economic Review*, 39, 859-87.

[5] Faini, R., A.M. Falzoni, M. Galeotti, R. Helg and A. Turrini, (1999), "Importing jobs and exporting firms? On the wage and employment implications of Italian trade and foreign direct investment flows", *Giornale degli Economisti ed Annali di Economia*, 58 (1), 95-135.

[6] Fajnzylber, P. and W. Maloney, (2001), "Labour demand and trade reform in Latin America", World Bank Working Paper No. 2491, January.

[7] Feenstra, R. and G. Hanson, (2001), "Global production sharing and rising inequality: A survey of trade and wages", NBER W.P. 8372, July.

[8] Greenaway, D., R.C. Hine and P.Wright, (1999), "An empirical assessment of the impact of trade on employment in the United Kingdom", *European Journal of Political Economy*, 15, 485-500.

[9] Hamermesh, D.S., (1993), *Labor Demand*, Princeton University Press, Princeton.

[10] Hamermesh, D.S., (2000), Demand for labor, in International Encyclopaedia of the Social & Behavioural Sciences

[11] Harris, M.N., and L. Matyas, (2000), "A comparative analysis of different estimators for dynamic panel data models", mimeo.

[12] Jean, S., (2000), "The effect of international trade on labour-demand elasticities: intersectoral matters", *Review of International Economics*, 8(3), 504-516.

[13] Kiviet, J.F., (1995), “On bias, inconsistency and efficiency of various estimators in dynamic panel data models”, *Journal of Econometrics, 68, 53-78.*

[14] Krishna, P., D. Mitra and S. Chinoy, (2001), ”Trade liberalization and labour demand elasticities: evidence from Turkey”, *Journal of International Economics,* forthcoming.

[15] Nickell, S.J., (1981), “Biases in Dynamic Models with Fixed Effects”, *Econometrica*, 49, 1417-1426.

[16] Panagariya, A., (1999), Trade openness: consequences for the elasticity of demand for labor and wage outcomes, mimeo.

[17] Pflüger, M., (2001), Trade, technology and labour markets: empirical controversies in the light of the Jones model, IZA DP No. 324, July.

[18] Rauch, J.E. and V. Trindade, (2000), “Information and globalisation: Wage co-movements, labour demand elasticity and conventional trade liberalization”, NBER W.P. 7671 April.

[19] Rodrik, D., (1997), *Has globalisation gone too far?*, Institute for International Economics, Washington DC.

[20] Slaughter, M.J., (2001), ”International trade and labor-demand elasticities”, *Journal of International Economics*, 54, 27-56.

[21] Taylor, M. P. and L Sarno, (1998), The behaviour of real exchange rates during the post-Bretton Woods period, *Journal of International Economics*, 46, 281-312.

APPENDIX

Description of the Data Set

Table A1 - Industry Codes, Definitions and Labels

ISIC Revision 2	Industry Description	Industry Labels*
311/2	Food	fod
3130	Beverages	bev
3140	Tobacco	tob
3210	Textiles	tex
3220	Wearing Apparel	wear
3230	Leather & Products	leather
3240	Footwear	foot
3310	Wood Products	wood
3320	Furniture & Fixtures	furn
3410	Paper & Products	pap
3420	Printing & Publishing	print
3510	Industrial Chemicals	indche
3520	Other Chemicals	DRUGS&CHE
3522	Drugs & Medicines	drugs
3520 less 3522	Chemical Products n.e.c.**	che
3530	Petroleum Refineries	petref
3540	Petroleum & Coal Products	petcoal
3530 and 3540	Petroleum Refineries & Products	REF&COAL
3550	Rubber Products	rub
3560	Plastic Products, n.e.c.	plas
3610	Pottery, China etc.	pot
3620	Glass & Products	glass
3690	Non-Metallic Products, n.e.c.	nmetp
3710	Iron & Steel	festeel
3720	Non-Ferrous Metals	nferm
3810	Metal Products	met
3820	Non-Electrical Machinery	OECOMP&MAEQUIP
3825	Office & Computing Machinery	ocomp
3820 less 3825	Machinery & Equipment, n.e.c.	maequi
3830	Electrical Machinery	COMM&ELEC
3832	Radio, TV & Communication Equipment	comm
3830 less 3832	Electrical Apparatus, n.e.c.	elec
3841	Ship-Building & Repairing	ship
3842	Railroad Equipment	rail
3843	Motor Vehicles	moto
3844	Motorcycles & Bicycles	mcycles
3845	Aircraft	air
3849	Transport Equipment, n.e.c.	transp
3842 and 3844 and 3849	Railroad Equipment, Motorcycles & Bicycles, Transport Equipment, n.e.c.	RAIL&MCYCLES&TRANS
3850	Professional Goods	prof
3900	Other Manufacturing, n.e.c.	other

* These regression codes refer to the labels that have been attributed to the different industries in the empirical work .
** n.e.c. stands for “not elsewhere classified”.

Table A2 - Time period considered and industries that have not been included in the different country regressions

Country	Time period	Industries Removed
ITALY	1971-1994	drugs, chemical, ocomp, maequip, comm, elec, rail, mcycles, transp,
FRANCE	1976-1995	drugs, chemical, petcoal, ocomp, maequip, comm, elec, transp
UK	1976-1994	drugs, chemical, ocomp, maequip, comm, elec, rail, mcycles, transp, REF&COAL
JAPAN	1970-1996	drugs, chemical, ocomp, maequip, comm, elec, rail, mcycles, air, transp, RAIL&MCYCLES&TRANS
USA	1971-1996	drugs, chemical, oecomp, maequip, comm, elec, rail, mcycles, air, transp, RAIL&MCYCLES&TRANS
SWEDEN	1970-1996	drugs, chemical, oecomp, maequip, comm, elec, rail, mcycles, air, transp, RAIL&MCYCLES&TRANS
SPAIN	1978-1992	drugs, chemical, oecomp, maequip, comm, elec, rail, mcycles, air, transp, RAIL&MCYCLES&TRANS
GERMANY	1978-1994	comm, elec, rail, mcycles, transp,

Table A3 - STAN Variables: Definitions

Variable	**Regression Code**	**STAN Definition**
Value Added	VA	This represents the contribution of each industry to national GDP in current prices
Values Added 1990	VA90	This represents the contribution of each industry to national GDP in constant 1990 prices
Number Engaged	NE	This includes the number of employees as well as self-employed, owner proprietors, and unpaid family workers
Labour Compensation	COMP	Current price national accounts compatible labour costs which include wages as well as the costs of supplements such as employer's compulsory pension or medical payments
Imports, Exports	IMP, EXP	These represent imports and exports in current prices. These data are derived from the OECD's Foreign Trade by Commodities Database. The data have been converted from the Standard International Trade Classification (SITC), rev. 1, 2, and 3, to ISIC rev. 2 categories using standard conversion tables

Table A4 - Constructed Variables

Variable	Description
P90, value added deflator	VA/VA90
Wnom, average remuneration of labour	COMP/NE
W90, average remuneration price index	Wnom/value taken by Wnom in 1990
w, relative remuneration of labour	W90/P90
g1	IMP/VA
g2	(EXP +IMP)/VA
gs	(total sales of foreign affiliates)/VA

Table 1a. Regression results for France

	Eq 1. LSDV-dynamic (g2=IMP/VA)	Eq 2. LSDV-dynamic (g1=IMP+EXP/VA	Eq 3. A-B g2=IMP/VA	Eq 4. A-B g1=IMP+EXP/VA)
LnNE_1	1.01 (9.05)**	1.01 (9.27)**	0.88 (13.34)**	0.88 (14.54)**
LnNE_2	-0.18 (-2.06)**	-0.18 (-2.10)**	-0.13 (-3.26)**	-0.14 (-3.71)**
LnVA90	0.19 (5.16)**	0.20 (5.18)**	0.25 (5.68)**	0.27 (5.27)**
Lnw_1	-32.07 (-1.11)	-34.44 (-1.53)	-29.43 (-1.19)	-44.63 (-1.74)*
Lngw_1	-0.10 (-2.36)**	-0.06 (-2.41)**	-0.23 (-5.41)**	-0.13 (-5.73)**
Lnyearw_1	4.22 (1.41)	4.54 (1.53)	3.88 (1.19)	5.88 (1.75)*
Lng	0.03 (1.18)	0.03 (1.73)*	0.05 (2.06)**	0.06 (1.88)*
Lnyear	-10.69 (-5.11)**	-11.06 (-5.30)**	-16.08 (-7.97)**	-16.67 (-8.08)**
Observations	594	594	561	561
Number of sectors	33	33	33	33
R-squared	0.96	0.96		
F-test (p-value)	5.74 (0.00)	5.86 (0.00)		
A-B II (p-value)			-0.65 (0.51)	-0.71 (0.48)

Table 1b. Short and long term labour demand elasticity: France

	mean	std. dev.	min	max
Eq 1. Short-term El.	-0.05	0.03	-0.13	0.01
Eq 1. Long-term El.	-0.26	0.14	-0.73	0.07
Eq 2. Short-term El.	-0.06	0.02	-0.11	0.00
Eq 2. Long-term El.	-0.32	0.12	-0.63	0.02
Eq 3. Short-term El.	-0.06	0.06	-0.26	0.05
Eq 3. Long-term El.	-0.22	0.21	-1.00	0.19
Eq 4. Short-term El.	-0.07	0.04	-0.18	0.03
Eq 4. Long-term El.	-0.28	0.16	-0.70	0.13

* significant at 10% level; ** significant at 5% level

Note: robust t-statistics for the LSDV estimates are given in parenthesis.
robust z-statistics for the Arellano-Bond estimates are given in parenthesis.
F-test: tests for H_0: no industry fixed effect
A-B II: Arellano-Bond test for H_0: no second order correlation in the residuals

Table 2a. Regression results for Germany

	Eq 1. LSDV-dynamic (g2=IMP/VA)	Eq 2. LSDV-dynamic (g1=IMP+EXP/VA)	Eq 3. A-B (g2=IMP/VA)	Eq 4. A-B (g1=IMP+EXP/VA)
LnNE_1	1.19 (30.65)**	1.19 (30.62)**	1.16 (13.73)**	1.16 (25.70)**
LnNE_2	-0.32 (-8.98)**	-0.33 (-9.04)**	-0.31 (-6.37)**	-0.32 (-8.88)**
LnVA90	0.28 (14.28)**	0.28 (14.00)**	0.32 (14.30)**	0.31 (14.09)**
Lnw_1	70.97 (2.39)**	75.42 (2.50)**	104.91 (1.77)*	114.10 (2.85)**
Lngw_1	-0.05 (-2.08)**	-0.02 (-1.14)	-0.06 (-0.61)	-0.04 (-1.30)
Lnyearw_1	-9.36 (-2.39)**	-9.95 (-2.50)**	-13.83 (-1.77)*	-15.04 (-2.86)**
Lng	-0.03 (-1.92)*	-0.02 (-1.40)	-0.04 (-1.53)	-0.05 (-2.49)**
Lnyear	-7.97 (-9.97)**	-8.01 (-10.04)**	-8.39 (-5.58)**	-8.32 (-8.64)**
Observations	540	540	504	504
Number of sectors	36	36	36	36
R-squared	0.94	0.94		
F-test (p-value)	7.43 (0.00)	7.34 (0.00)		
A-B II (p-value)			-1.63 (0.10)	-1.73 (0.08)

Table 2b. Short and long term labour demand elasticity: Germany

	mean	std. dev.	min	max
Eq 1. Short-term El.	-0.16	0.03	-0.26	-0.10
Eq 1. Long-term El.	-1.19	0.22	-1.88	-0.73
Eq 2. Short-term El.	-0.17	0.03	-0.23	-0.11
Eq 2. Long-term El.	-1.23	0.20	-1.70	-0.80
Eq 3. Short-term El.	-0.18	0.04	-0.30	-0.09
Eq 3. Long-term El.	-1.22	0.29	-2.05	-0.63
Eq 4. Short-term El.	-0.18	0.04	-0.28	-0.09
Eq 4. Long-term El.	-1.16	0.27	-1.80	-0.56

Table 3a. Regression results for Italy

	Eq 1. LSDV-dynamic (g2=IMP/VA)	Eq 2. LSDV-dynamic (g1=IMP+EXP/VA)	Eq 3. A-B g2=IMP/VA	Eq 4. A-B g1=IMP+EXP/VA
LnNE_1	0.81 (47.2)**	0.81 (47.36)**	0.74 (17.28)**	0.74 (18.04)**
LnVA90	0.17 (10.9)**	0.17 (10.74)**	0.26 (10.69)**	0.27 (12.01)**
Lnw	-21.64 (-1.57)	-19.21 (-1.39)	-34.44 (-1.50)	-43.91 (-1.92)*
Lngw	0.03 (1.62)*	0.03 (1.67)*	0.01 (0.19)	-0.02 (-0.41)
Lnyearw	2.83 (1.56)	2.51 (1.38)	4.51 (1.49)	5.76 (1.91)*
Lng	0.04 (2.77)**	0.03 (1.68)*	0.07 (3.07)**	0.04 (1.43)
Lnyear	-6.63 (-9.98)**	-6.45 (-9.41)**	-9.93 (-4.29)**	-9.76 (-11.62)**
Observations	736	736	704	704
Number of sectors	32	32	32	32
R-squared	0.92	0.92		
F-test (p-value)	7.91 (0.00)	7.82 (0.00)		
A-B II (p-value)			0.12 (0.91)	0.17 (0.86)

Table 3b. Short and long term labour demand elasticity: Italy

	mean	std. dev.	min	max
Eq 1. Short-term El.	-0.14	0.02	-0.18	-0.09
Eq 1. Long-term El.	-0.77	0.09	-0.93	-0.50
Eq 2. Short-term El.	-0.14	0.02	-0.18	-0.09
Eq 2. Long-term El.	-0.77	0.09	-0.95	-0.48
Eq 3. Short-term El.	-0.20	0.02	-0.23	-0.16
Eq 3. Long-term El.	-0.75	0.06	-0.86	-0.62
Eq 4. Short-term El.	-0.20	0.02	-0.24	-0.15
Eq 4. Long-term El.	-0.75	0.08	-0.92	-0.58

Table 4a. Regression results for Japan

	Eq 1. LSDV-dynamic (g2=IMP/VA)	Eq 2. LSDV-dynamic (g1=IMP+EXP/VA)	Eq 3. A-B (g2=IMP/VA)	Eq 4. A-B (g1=IMP+EXP/VA)
LnNE_1	0.91 (68.2)**	0.90 (68.01)**	0.82 (35.99)**	0.82 (36.27)**
LnVA90	0.11 (8.82)**	0.10 (8.46)**	0.14 (5.69)**	0.13 (4.97)**
Lnw_1	-10.14 (-1.12)	-15.76 (-1.71)*	-20.32 (-1.25)	-26.77 (-1.57)
Lngw_1	0.06 (2.91)**	-0.05 (-2.24)**	0.10 (2.58)**	-0.02 (-0.35)
Lnyearw_1	1.33 (1.12)	2.07 (1.71)*	2.66 (1.24)	3.52 (1.56)
Lng	-0.04 (-1.91)*	-0.07 (-3.54)**	-0.01 (-0.23)	-0.03 (-0.76)
Lnyear	-1.48 (-2.74)**	-2.01 (-3.67)**	-3.00 (-2.26)**	-3.45 (-2.52)**
Observations	780	780	750	750
Number of sectors	30	30	30	30
R-squared	0.92	0.92		
F-test (p-value)	6.56 (0.00)	6.06 (0.00)		
A-B II (p-value)			-0.90 (0.37)	-1.28 (0.31)

Table 4b. Short and long term labour demand elasticity: Japan

	mean	std. dev.	min	max
Eq 1. Short-term El.	-0.05	0.02	-0.08	0.03
Eq 1. Long-term El.	-0.62	0.18	-0.86	0.31
Eq 2. Short-term El.	-0.04	0.01	-0.09	-0.01
Eq 2. Long-term El.	-0.46	0.15	-0.97	-0.13
Eq 3. Short-term El.	-0.06	0.03	-0.10	0.07
Eq 3. Long-term El.	-0.35	0.15	-0.56	0.39
Eq 4. Short-term El.	-0.05	0.01	-0.08	-0.02
Eq 4. Long-term El.	-0.29	0.08	-0.45	-0.12

Table 5a. Regression results for Spain

	Eq 1. LSDV-dynamic (g2=IMP/VA)	Eq 2. LSDV-dynamic (g1=IMP+EXP/VA)	Eq 3. A-B (g2=IMP/VA)	Eq 4. A-B (g1=IMP+EXP/VA)
LnNE_1	0.70 (14.53)**	0.71 (14.61)**	0.65 (12.35)**	0.67 (13.90)**
LnVA90	0.25 (6.72)**	0.25 (6.49)**	0.36 (9.61)**	0.36 (10.02)**
Lnw	-123.68 (-2.13)**	-156.84 (-2.71)**	-157.91 (-1.75)*	-201.22 (-2.33)**
Lngw	-0.04 (-1.31)	-0.04 (-1.03)	-0.07 (-1.19)	-0.12 (-1.73)*
Lnyearw	16.27 (2.10)**	20.64 (2.71)**	20.77 (1.74)*	26.49 (2.33)**
Lng	0.08 (2.84)**	0.03 (1.18)	0.06 (1.00)	-0.02 (-0.30)
Lnyear	-4.23 (-1.83)*	-2.17 (-1.03)	-4.86 (-1.15)	-1.79 (-0.45)
Observations	420	420	390	390
Number of sectors	30	30	30	30
R-squared	0.85	0.85		
F-test (p-value)	5.46 (0.00)	5.01 (0.00)		
A-B II (p-value)			-1.43 (0.15)	-1.75 (0.08)

Table 5b. Short and long term labour demand elasticity: Spain

	mean	std. dev.	min	max
Eq 1. Short-term El.	-0.15	0.02	-0.24	-0.14
Eq 1. Long-term El.	-0.49	0.12	-0.81	-0.26
Eq 2. Short-term El.	-0.13	0.04	-0.23	-0.04
Eq 2. Long-term El.	-0.43	0.15	-0.79	-0.13
Eq 3. Short-term El.	-0.19	0.05	-0.33	-0.10
Eq 3. Long-term El.	-0.54	0.13	-0.94	-0.28
Eq 4. Short-term El.	-0.17	0.06	-0.36	-0.03
Eq 4. Long-term El.	-0.51	0.19	-1.07	-0.09

Table 6a. Regression results for Sweden

	Eq 1. LSDV-dynamic (g2=IMP/VA)	Eq 2. LSDV-dynamic (g1=IMP+EXP/VA)	Eq 3. A-B (g2=IMP/VA)	Eq 4. A-B (g1=IMP+EXP/VA)
LnNE_1	0.87 (23.34)**	0.88 (43.04)**	0.78 (22.82)**	0.79 (21.01)**
LnVA90	0.15 (7.64)*	0.15 (7.62)**	0.21 (5.67)**	0.21 (5.48)**
Lnw_1	10.79 (0.91)	9.69 (0.82)	9.88 (0.48)	9.66 (0.45)
Lngw_1	0.01 (0.73)	0.001 (0.08)	0.03 (1.17)	0.02 (0.69)
Lnyearw_1	-1.43 (-1.02)	-1.28 (-0.83)	-1.31 (0.49)	-1.28 (-0.46)
Lng	-0.01 (-0.32)	-0.001 (-0.05)	-0.03 (-1.28)	-0.02 (-0.78)
Lnyear	-7.53 (-7.71)**	-7.50 (-7.12)**	-11.08 (-7.93)**	-10.86 (-7.66)**
Observations	780	780	750	750
Number of sectors	30	30	30	30
R-squared	0.95	0.95		
F-test (p-value)	5.23 (0.00)	5.15 (0.00)		
A-B II (p-value)			-1.20 (0.23)	-1.18 (0.24)

Table 6b. Short and long term labour demand elasticity: Sweden

	mean	std. dev.	min	max
Eq 1. Short-term El.	-0.05	0.01	-0.07	-0.02
Eq 1. Long-term El.	-0.42	0.06	-0.55	-0.15
Eq 2. Short-term El.	-0.05	0.005	-0.06	-0.04
Eq 2. Long-term El.	-0.45	0.04	-0.53	-0.36
Eq 3. Short-term El.	-0.07	0.02	-0.10	0.02
Eq 3. Long-term El.	-0.33	0.09	-0.48	0.10
Eq 4. Short-term El.	-0.07	0.01	-0.10	-0.01
Eq 4. Long-term El.	-0.33	0.06	-0.46	-0.05

Table 7a. Regression results for the UK

	Eq 1. LSDV-dynamic (g2=IMP/VA)	Eq 2. LSDV-dynamic (g1=IMP+EXP/VA)	Eq 3. A-B (g2=IMP/VA)	Eq 4. A-B (g1=IMP+EXP/VA)
LnNE_1	0.92 (45.43)**	0.91 (42.22)**	0.83 (22.23)**	0.82 (23.83)**
LnVA90	0.17 (6.27)**	0.16 (5.79)**	0.31 (7.30)**	0.29 (6.81)**
Lnw	28.52 (0.60)	28.63 (0.79)	78.22 (1.14)	79.66 (1.21)
Lngw	-0.07 (-1.43)	-0.07 (-1.82)*	-0.06 (-1.01)	-0.07 (-1.71)*
Lnyearw	-3.76 (-0.80)	-3.77 (-0.79)	-10.31 (-1.14)	-10.49 (-1.21)
Lng	0.01 (0.62)	-0.002 (-0.09)	0.07 (2.86)**	0.04 (3.08)**
Lnyear	-6.92 (-4.22)**	-6.61 (-4.05)**	-15.44 (-5.21)**	-15.21 (-5.05)**
Observations	576	576	544	544
Number of sectors	32	32	32	32
R-squared	0.95	0.95		
F-test (p-value)	5.10 (0.00)	5.04 (0.00)		
A-B II (p-value)			1.03 (0.30)	0.84 (0.40)

Table 7b. Short and long term labour demand elasticity: UK

	mean	std. dev.	min	max
Eq 1. Short-term El.	-0.05	0.03	-0.12	0.00
Eq 1. Long-term El.	-0.59	0.31	-1.46	0.05
Eq 2. Short-term El.	-0.04	0.03	-0.13	0.03
Eq 2. Long-term El.	-0.44	0.37	-1.49	0.33
Eq 3. Short-term El.	-0.08	0.04	-0.17	-0.001
Eq 3. Long-term El.	-0.48	0.22	-1.02	-0.01
Eq 4. Short-term El.	-0.07	0.04	-0.19	0.03
Eq 4. Long-term El.	-0.39	0.25	-1.09	0.17

Table 8a. Regression results for the US

	Eq 1. LSDV-dynamic (g2=IMP/VA)	Eq 2. LSDV-dynamic (g1=IMP+EXP/VA)	Eq 3. A-B g2=IMP/VA	Eq 4. A-B g1=IMP+EXP/VA
LnNE_1	0.88 (50.55)**	0.88 (51.51)**	0.82 (17.96)**	0.82 (18.05)**
LnVA90	0.19 (10.82)**	0.19 (10.54)**	0.30 (7.49)**	0.30 (7.07)**
Lnw_1	29.30 (1.94)*	26.01 (1.68)*	54.99 (2.02)**	50.11 (1.76)*
Lngw_1	0.06 (2.31)**	0.03 (1.06)	0.08 (1.37)	0.03 (0.52)
Lnyearw_1	-3.88 (-1.92)*	-3.44 (-1.68)*	-7.27 (-2.03)**	-6.62 (-1.76)*
Lng	-0.01 (-0.62)	-0.02 (-1.18)	0.05 (0.95)	0.03 (0.58)
Lnyear	-6.72 (-9.84)**	-6.51 (-8.80)**	-12.21 (-4.75)**	-12.00 (4.15)**
Observations	750	750	720	720
Number of sectors	30	30	30	30
R-squared	0.92	0.92		
F-test (p-value)	9.85 (0.00)	9.54 (0.00)		
A-B II (p-value)			-0.98 (0.33)	-1.05 (0.30)

Table 8b. Short and long term labour demand elasticity: US

	mean	std. dev.	min	max
Eq 1. Short-term El.	-0.12	0.02	-0.16	-0.05
Eq 1. Long-term El.	-1.04	0.16	-1.40	-0.44
Eq 2. Short-term El.	-0.11	0.01	-0.15	-0.08
Eq 2. Long-term El.	-1.02	0.11	-1.30	-0.73
Eq 3. Short-term El.	-0.15	0.03	-0.22	-0.06
Eq 3. Long-term El.	-0.81	0.16	-1.19	-0.34
Eq 4. Short-term El.	-0.15	0.02	-0.20	-0.10
Eq 4. Long-term El.	-0.82	0.13	-1.11	0.54

Figure 1a. Sectoral trends in French long-term elasticity with g2 (A-B).

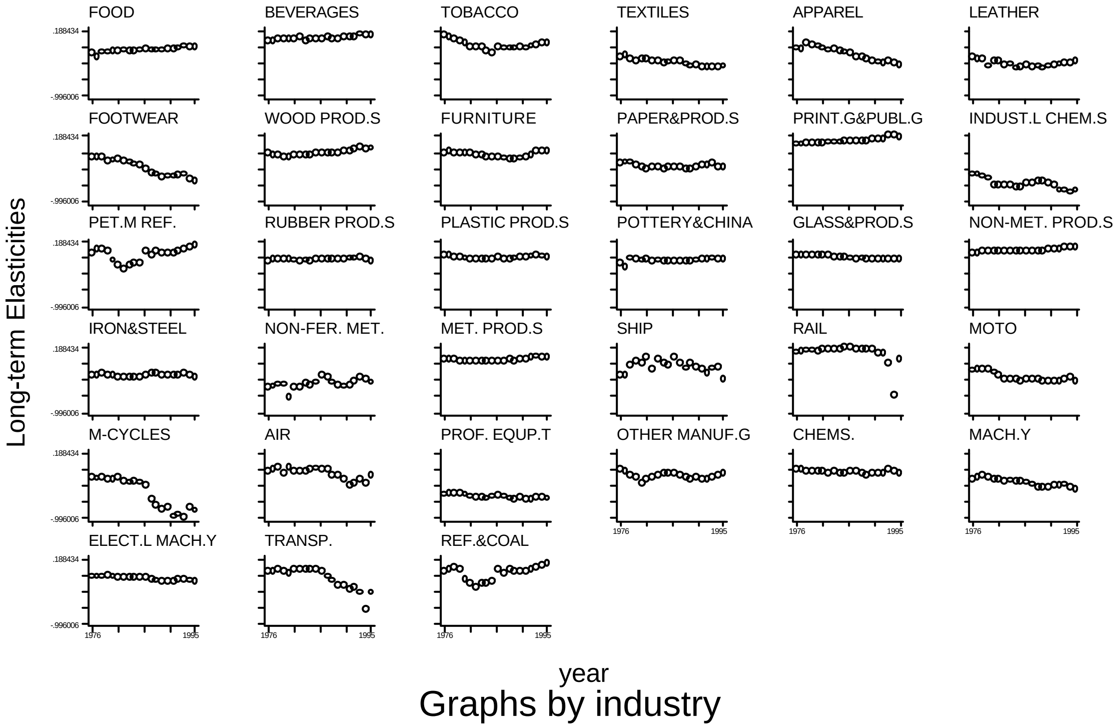

Figure 1b. Sectoral trends in the globalisation component of French long-term elasticity (g2, AB regression).

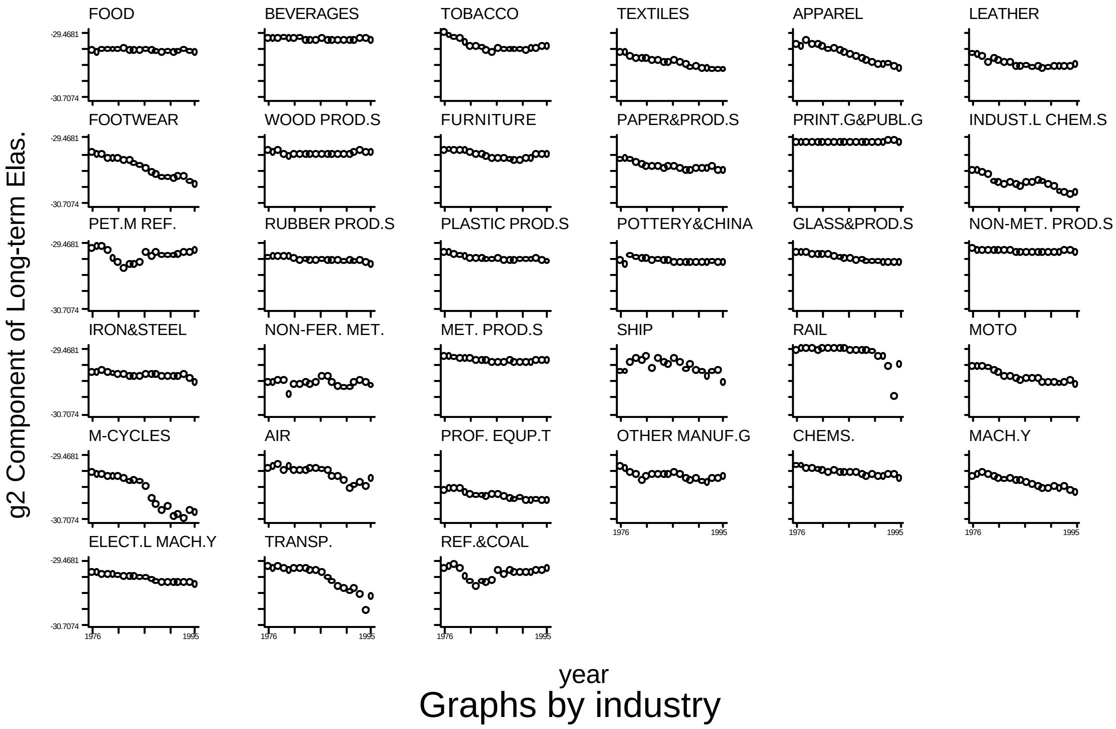

Figure 2a. Sectoral trends in German long-term elasticity with g2 (A-B).

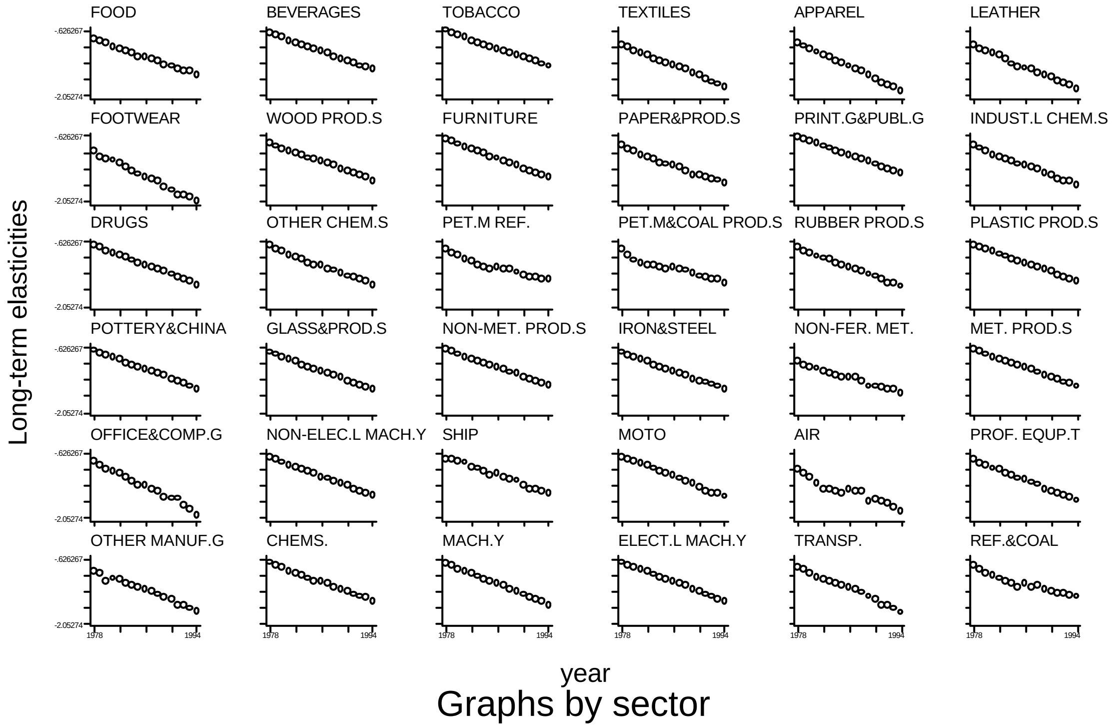

Figure 2b. Sectoral trends in the globalisation component of German long-term elasticity (g2, AB regression).

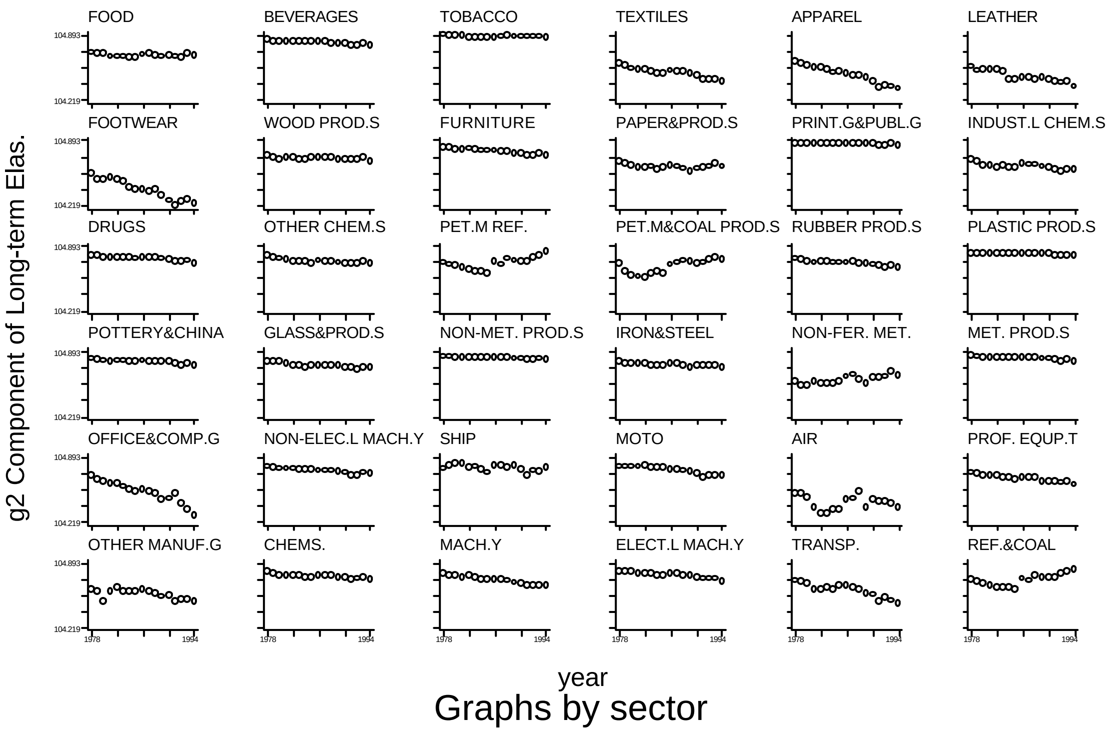

Figure 3a. Sectoral trends in Italian long-term elasticity with g2 (A-B).

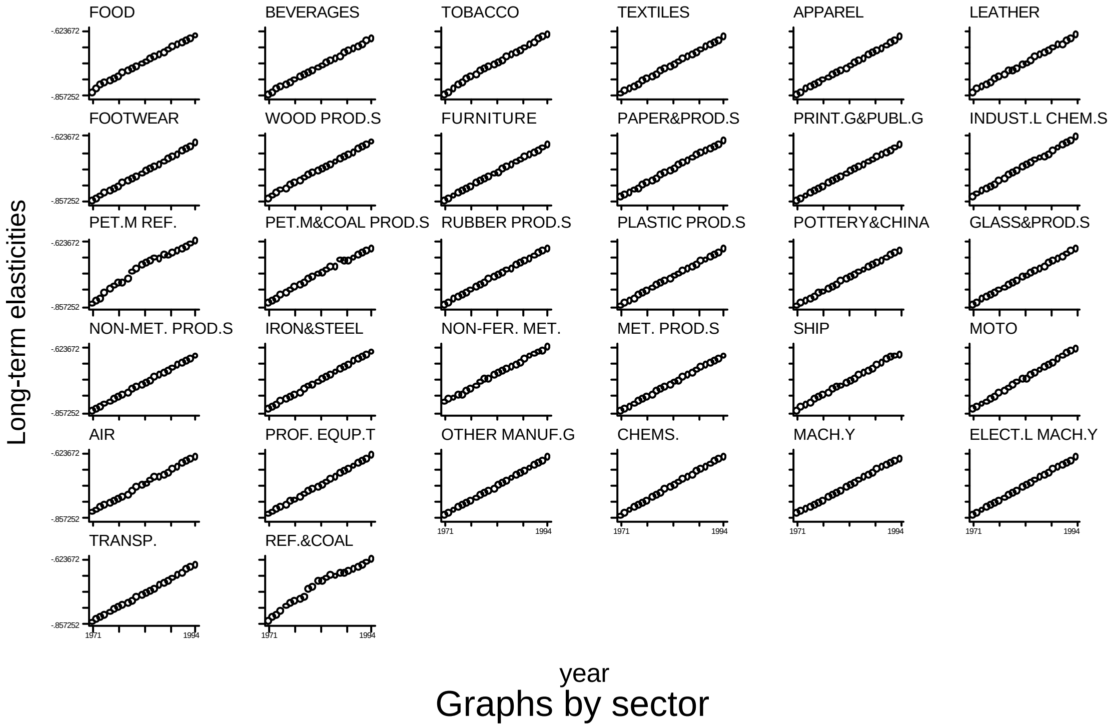

Figure 3b. Sectoral trends in the globalisation component of Italian long-term elasticity (g2, AB regression).

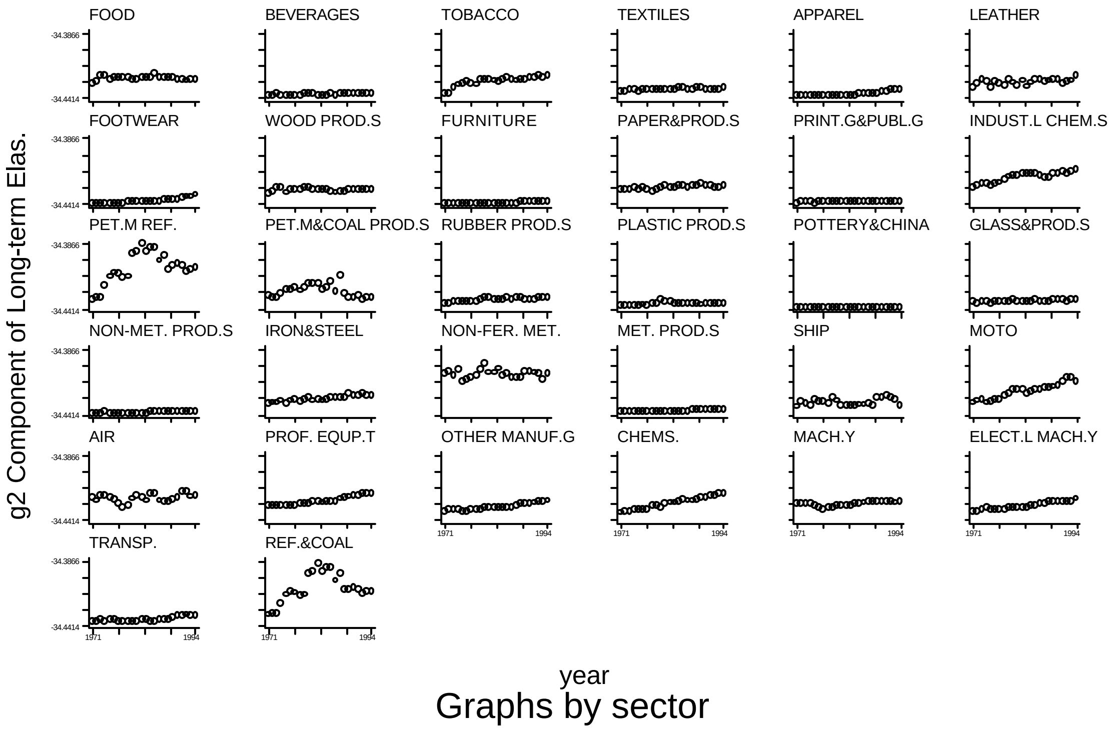

Figure 4a. Sectoral trends in Japanese long-term elasticity with g2 (A-B).

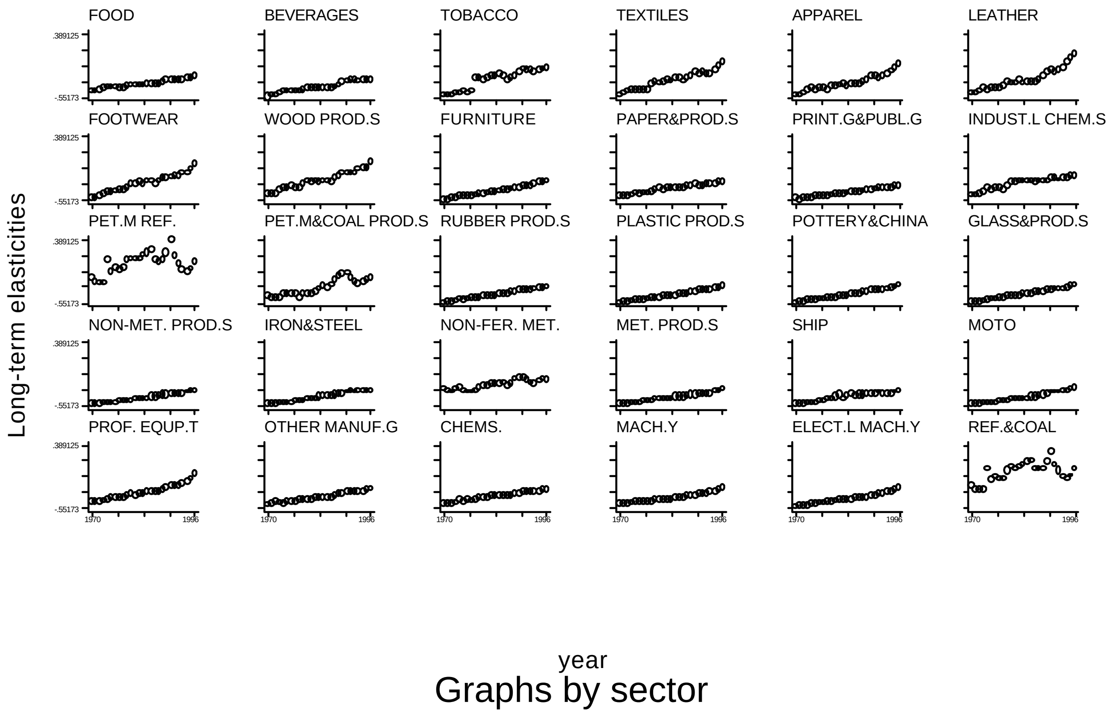

Figure 4b. Sectoral trends in the globalisation component of Japanese long-term elasticity (g2, AB regression).

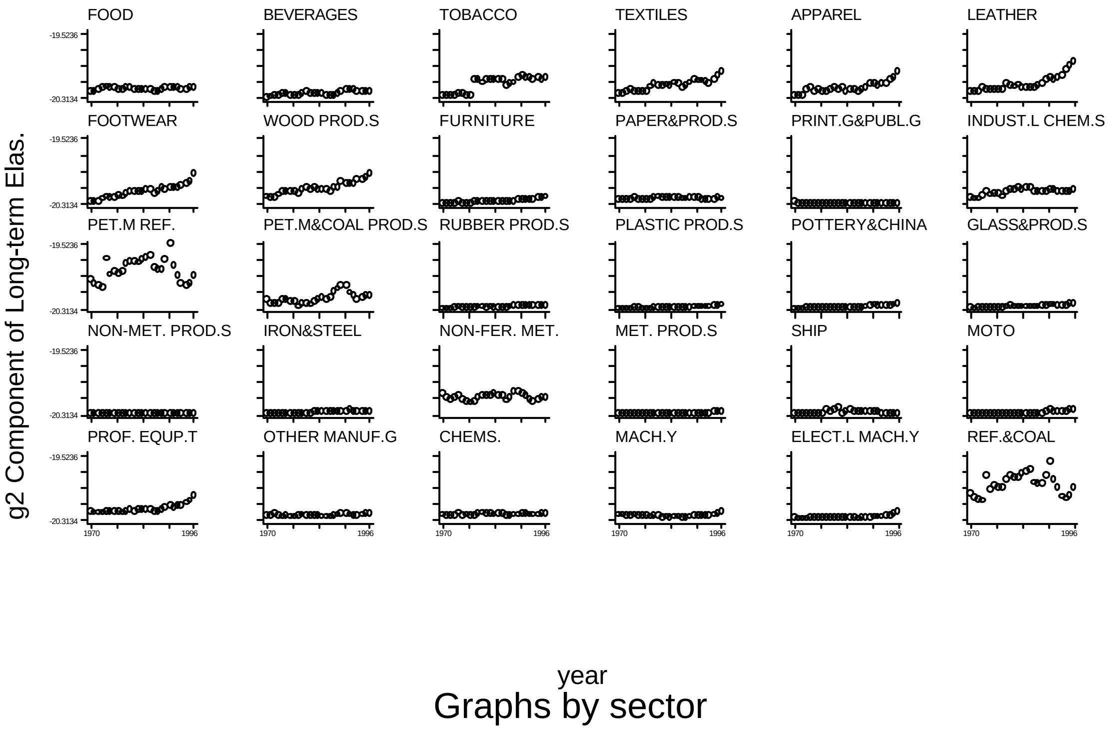

Figure 5a. Sectoral trends in Spanish long-term elasticity with g2 (A-B)

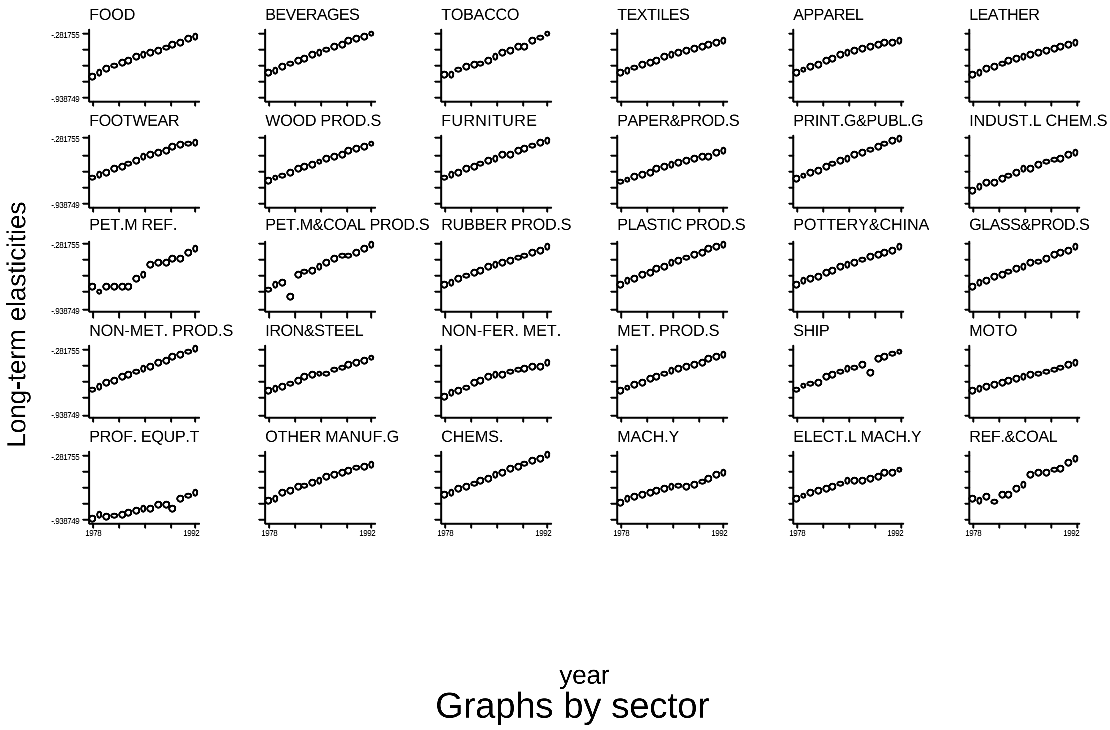

Figure 5b. Sectoral trends in the globalisation component of Spanish long-term elasticity (g2, AB regression).

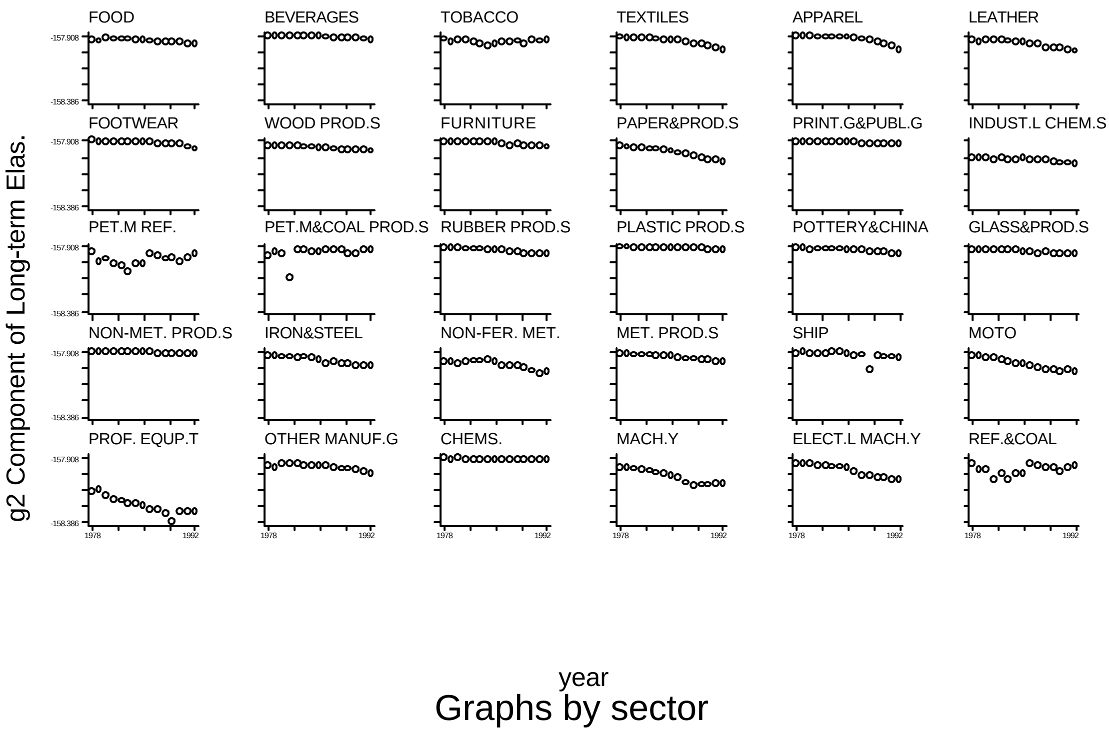

Figure 6a. Sectoral trends in Swedish long-term elasticity with g2 (A-B)

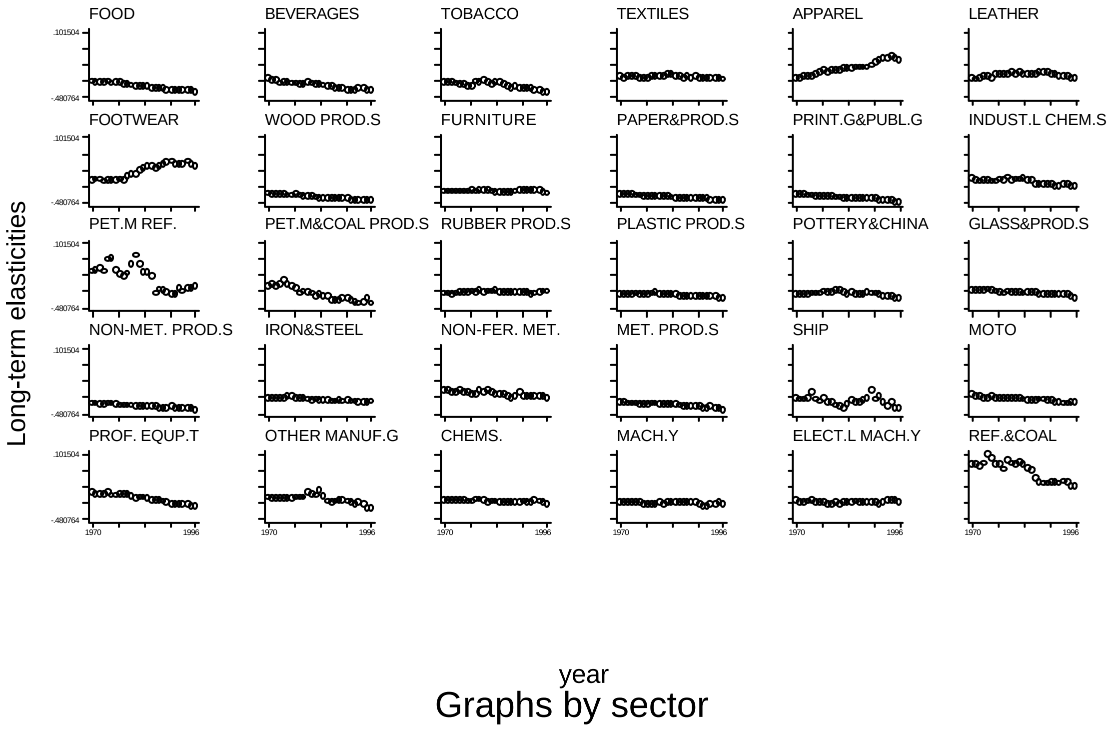

Figure 6b. Sectoral trends in the globalisation component of Swedish long-term elasticity (g2, AB regression).

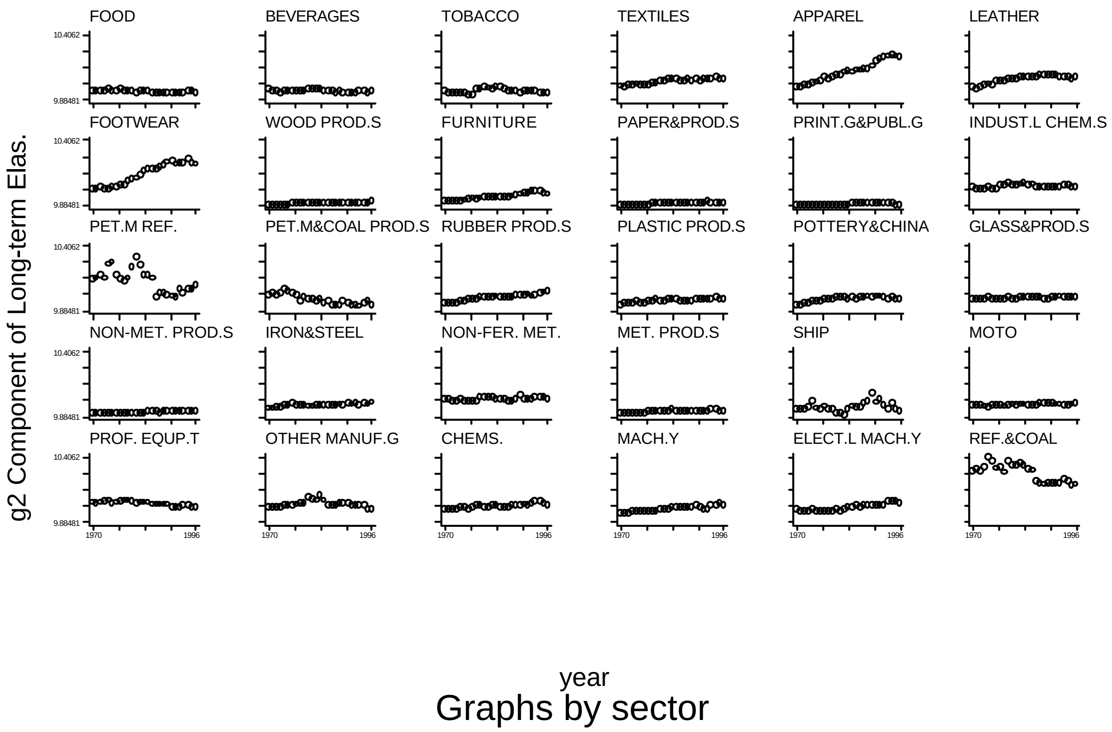

Figure 7a. Sectoral trends in UK long-term elasticity with g2 (A-B)

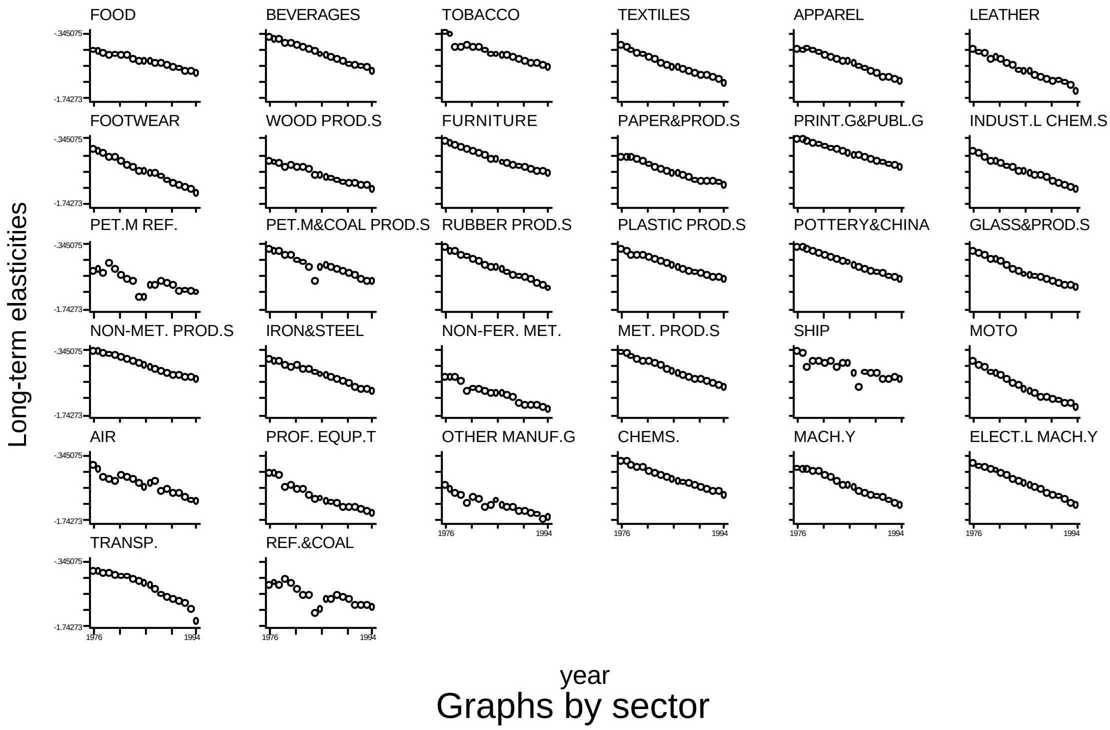

Figure 7b. Sectoral trends in the globalisation component of UK long-term elasticity (g2, AB regression).

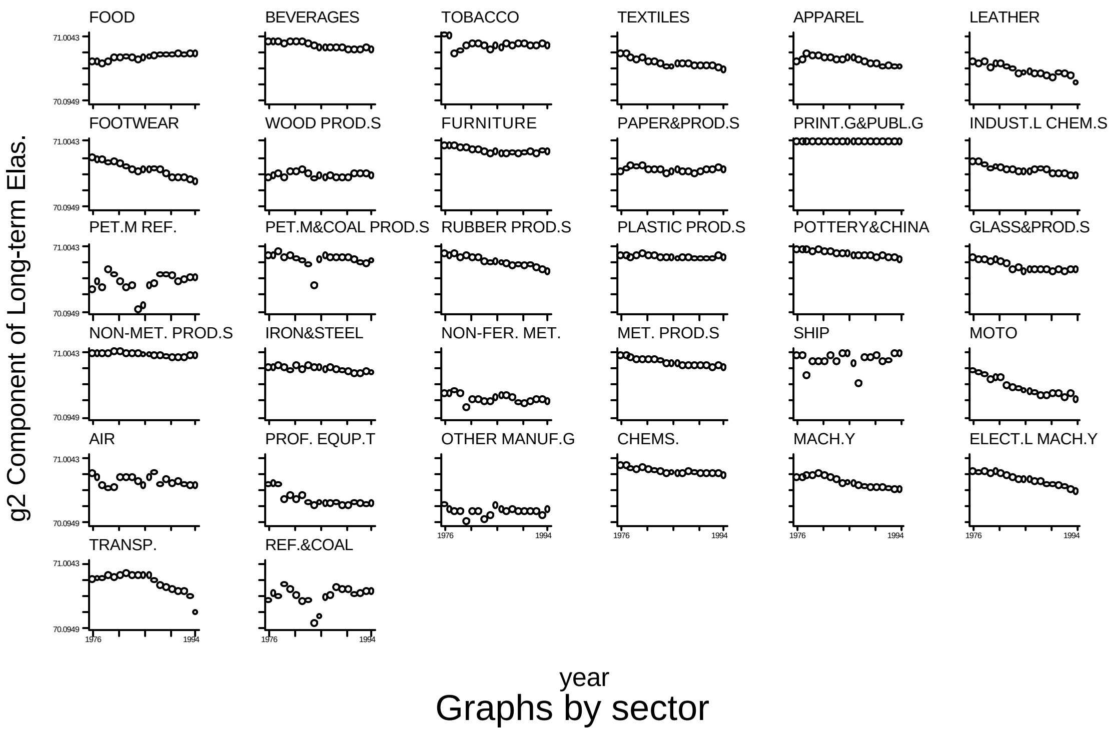

Figure 8a. Sectoral trends in US long-term elasticity with g2 (A-B)

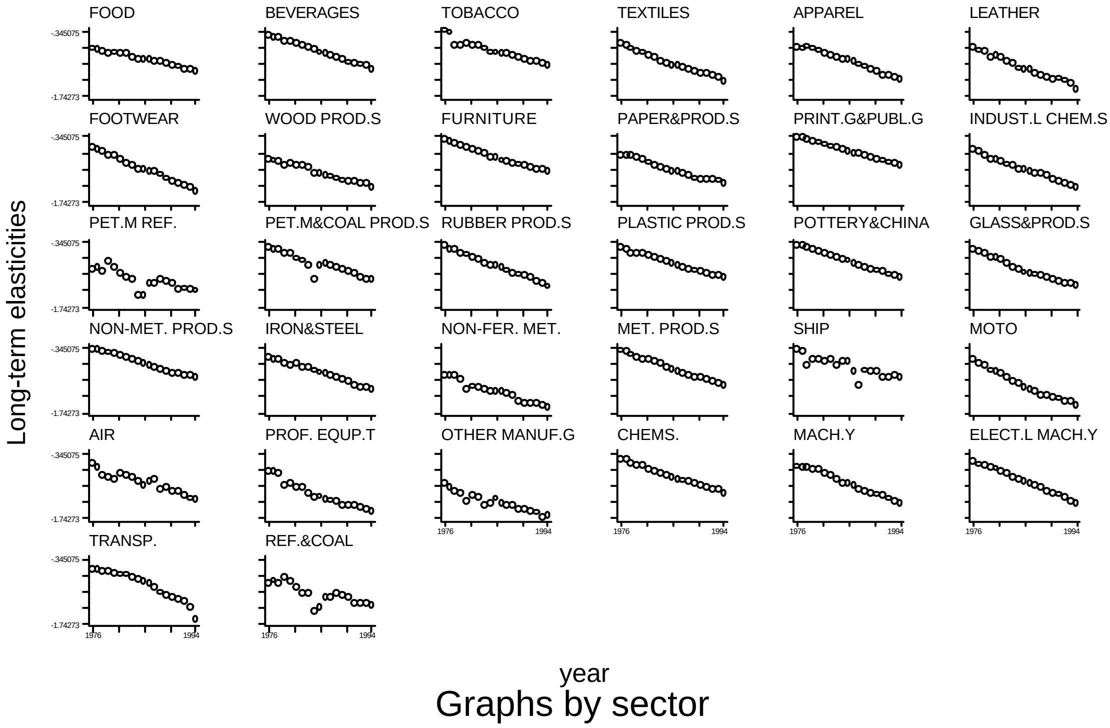

Figure 8b. Sectoral trends in the globalisation component of US long-term elasticity (g2, AB regression).