



Unions, competition and international trade in general equilibrium[☆]

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ABSTRACT

We develop a two-country, multi-sector model of oligopoly in which unionised and non-unionised sectors interact in general equilibrium. The model is used to study the impact of trade liberalisation, deunionisation and firm entry on wages in unionised and non-unionised sectors, and on welfare. We find that a shift from autarky to free trade increases non-union wages and welfare, whereas the effect on union wages is ambiguous. We also show that partial deunionisation leads to higher wages in both unionised and non-unionised sectors, but only increases welfare when the proportion of unionised sectors is sufficiently low. Finally, wages in non-unionised sectors necessarily increase with firm entry, while the response of union wages and welfare depends on the trade regime.

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1. Introduction

In recent years the labour market effects of increased globalisation have inspired many passionate discussions. Advocates of globalisation often argue that fiercer product market competition and trade liberalisation have the potential to induce a general increase in living standards. Less enthusiastic observers, however, often voice the concern that a more competitive product market goes hand in hand with the erosion of trade union power, thereby implying the end of decent pay for many workers.¹

This concern has been particularly noticeable in Europe, where the labour market in most countries is characterised by a strong union presence. According to the OECD (2004), the proportion of the workforce covered by union agreements was over 67% on average in European nations, versus only 14% in the US.² In addition to the wider coverage, the typical European collective bargaining system is more

centralised than its US counterpart, with wage negotiations taking place predominantly at the industry-level. In recent years, however, a number of countries have moved towards a more decentralised wage setting system, with union bargaining at the level of the individual plant or firm being favoured instead.³

How might we expect harsher competition and trade liberalisation to impact on labour market outcomes when unions are present? This is the question we set out to address in our paper. There is, of course, a sizeable body of theoretical research that does just that. The framework used in the central contributions to this literature is the partial equilibrium oligopoly model, augmented to allow for union wage setting in the labour market. An important early result in this literature, due to Huizinga (1993) and Sørensen (1993), shows that in a symmetric two-country model where labour markets in both countries are unionised, the wage under free trade is lower than in autarky. Using the same framework, Naylor (1998, 1999) looks at a complementary question and shows that in a situation of restricted trade a reduction in trade barriers *increases* wages. The public perception that international trade reduces the power of labour unions is therefore supported by the model if one compares the two extreme situations of autarky and free trade, but not for the intermediate case of gradual liberalisation.⁴ In addition to the papers that look at the situation

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¹ See e.g. Rodrik (1997, pp. 23ff.) and the references cited therein.

² Data on collective bargaining coverage refer to the year 2000, and the (unweighted) average is based on information for 20 European countries.

³ These include the UK and some Central and Eastern European nations. Wage negotiations at the national level were once prominent in the Northern European countries, but are now rarely observed in practice. For documentation see OECD (2004).

⁴ Munch and Skaksen (2002) allow for the presence of both fixed and variable trade costs and show that the results are sensitive as to which of these costs is lowered.

where unions are present in both countries, there are some high-profile contributions that look at the asymmetric case where unions are only present in one of the countries.⁵

A key advantage of the oligopoly framework is to allow for strategic interactions between firms and unions within an industry, and to investigate how these interactions are affected by lower trade barriers. An important shortcoming of that modelling approach, however, is that it abstracts from general equilibrium linkages between sectors or between goods markets and factor markets that have traditionally been of interest to trade economists. In fact, the analysis in this literature focuses on a single industry, where oligopolistic competition generates rents that organised labour seeks to capture in the form of higher wages. Although it is assumed that workers of the unionised industry can always find employment in a non-unionised sector, the wage rate in that industry (which constitutes the reservation wage of union workers) is exogenously given, and hence unaffected throughout the analysis.

In this paper, we develop a framework that allows for the interaction between unionised and non-unionised sectors in general equilibrium. To this end we build on the model by Neary (2009) who provides a theoretically consistent but tractable model of general oligopolistic equilibrium (GOLE).⁶ There are a small number of firms operating in each of a continuum of sectors, yielding a framework in which firms are large in their own sector but small in the economy as a whole. Hence they behave strategically against other firms in their own sector but treat factor prices and national income parametrically. As a distinguishing feature of our setup, we assume that unions are present in an exogenous subset of sectors – thereby transforming Neary's GOLE framework into a *unionised general oligopolistic equilibrium* (UGOLE) model. As each sector represents an infinitesimal part of the economy, firms and unions behave as in partial equilibrium models. In particular, as in Naylor (1998, 1999), unions set their wage demands in partial equilibrium, taking as given the wage rate in non-union sectors. Aggregation across sectors allows for the endogenous determination of economy-wide variables, most importantly the competitive wage rate and aggregate welfare. The model is used to study the impact of trade liberalisation, deunionisation and firm entry on wages in unionised and non-unionised sectors, and on welfare.⁷

Our main results are as follows. Within a context of intra-industry trade, further product market integration impacts on union wages through two different channels. Firstly, as shown by Naylor (1998, 1999), by reducing labour demand elasticity, integration leads monopoly unions to set higher wages. Secondly, by causing an increase in aggregate labour demand, integration causes an increase in the competitive wage, inducing a further rise in union wages. Because of this additional positive (general equilibrium) effect, union wages may actually be higher under free trade than in autarky, a result that contrasts with the previous literature. Another well established result from the unionised oligopoly in partial equilibrium, due to Dowrick

(1989), states that firm entry does not have a direct impact on union wages in a closed economy when wages are set at the industry-level.⁸ In the UGOLE framework firm entry in all sectors of a closed economy increases aggregate labour demand, leading to a higher competitive wage which in turn leads to a higher union wage. It is shown that this result has to be qualified somewhat in the open economy. General equilibrium links are also important when looking at the effects of “deunionisation”, i.e. a reduction in the proportion of sectors that are unionised: Aggregate labour demand increases, putting upward pressure on both competitive and union wages.

Besides the wage effects, we also consider the aggregate welfare effects of the different policy scenarios. We find that aggregate welfare increases as the economy moves from autarky to free trade, and rises with harsher product market competition in the open economy, but not in the closed economy. Our results also indicate that, although a perfectly competitive labour market always leads to the welfare maximum, partial deunionisation may reduce aggregate welfare. The remainder of the paper is organised as follows. Section 2 sets out the basic model. Section 3 shows how the partial equilibrium in each sector is determined, before Section 4 explores the general oligopolistic equilibrium. The comparative statics of the model are analysed in Section 5. In Section 6 we consider two extensions to our model. First we look at the case where union wage setting is at the firm level rather than the sector level, and second we introduce technology differences across sectors in a parsimonious way by assuming that unionised sectors are “low-tech” while non-unionised sectors are “high-tech”. Section 7 concludes.

2. Model setup

In this section we present a model of oligopoly in general equilibrium which allows for labour market unionisation in part of the economy. In doing so, we generalise the model developed by Naylor (1998, 1999) in two ways: firstly, we extend Naylor's partial equilibrium analysis to the case where n firms operate in each country and union wage setting occurs at the industry-level; secondly, we embed the resulting framework into the GOLE model introduced by Neary (2009).

Consider, then, a world consisting of two countries, 1 and 2, which are assumed to be identical in all respects. We describe the economy of country 1, simply noting that analogous conditions hold in country 2.

2.1. Technology

In country 1 there is continuum $[0,1]$ of imperfectly competitive industries, each producing a differentiated good. Each industry has n symmetric firms, where n is small. Hence, firms are relatively large in their own industry but represent an infinitesimal part of the economy as a whole. As a result, they have market power within their own sector but treat economy-wide variables parametrically.

Competition in each industry is Cournot. There are unspecified barriers facing new firms, and hence oligopoly rents are not eroded by entry. All income accrues to the aggregate household. Labour is the only factor of production. The marginal product of labour is constant, and is normalised to unity so that we can discuss output and employment interchangeably. In line with Brander (1981), national markets are assumed to be segmented and there is a specific tariff t per unit of commodity traded internationally.

⁵ See Brander and Spencer (1988), and Mezzetti and Dinopoulos (1991). The asymmetric oligopoly model has been extended by Lommerud et al. (2003) to allow for FDI, while Straume (2003) and Lommerud et al. (2006b) look at international mergers, and Lommerud et al. (2006a) focus on technological change.

⁶ See also Neary (2003) for a non-technical overview, and Neary (2007) for an application to cross-border mergers.

⁷ There is an earlier literature introducing unions into the Heckscher–Ohlin trade model, the classic paper being Johnson and Mieszkowski (1970). They model unions in a minimal way by simply assuming that their existence in one sector of the economy leads to an exogenous inter-sectoral wage differential. Indeed, other contributions to this literature like Jones (1971) or the textbook treatment of Bhagwati et al. (1998, ch. 25) do not even mention unions as the source of the wage differential. The literature gave a lot of attention to the possibility that the capital-intensity ranking of the two sectors might depend on whether physical or value intensities were looked at. This case of “diverging factor intensities” was shown to yield the possibility of paradoxical results, such as downward sloping goods supply functions – see Neary (1978) for a critical discussion.

⁸ See also Dhillon and Petrakis (2002) and Naylor (2002).

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