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Gabriel Felbermayr, Mario Larch, Wolfgang Lechthaler

Labour Market Reforms in a Globalised World

In the traditional model of international trade, labour market reforms in one country are often viewed as beggar-thy-neighbour policies, because they negatively affect the competitiveness and employment levels of the country's trading partners. Empirical evidence, however, suggests that this is not the case. By addressing labour market reforms in the context of intra-industry trade, this article explains how such reforms, while boosting employment, ultimately reduce a country's terms of trade, thereby benefitting the country's trading partners. The authors call for more international policy coordination to achieve optimal outcomes.

Many observers argue that the labour market reforms in Germany which aimed at lowering unemployment rates (the Hartz IV reforms) were in effect beggar-thy-neighbour policies: reduced effective unemployment benefits pushed down German wages relative to other countries, thereby increasing German competitiveness at the expense of its trading partners. In this way, the German labour market reforms were held responsible not just for the decrease in German unemployment but also for the increase in the unemployment rates of some trading partner countries. Comments by Christine Lagarde, then France's finance minister and now the head of the International Monetary Fund, and a report authored by the International Labour Organization prominently made these points.¹

The traditional model of international trade, which is based on comparative advantage, provides a rationale for this argument. Labour market policies of one country can worsen the competitiveness of other countries,

¹ In its Global Employment Trends 2012, the ILO said policies designed to push down wages, particularly under the government of Gerhard Schröder in 2003, benefited German exporters at the expense of other nations.

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thereby worsening their terms of trade, i.e. the ratio of the price of the domestic product to the price of the foreign product. This can lead to higher unemployment abroad. There are two problems with this argument. First, it is hardly supported by empirical evidence. Second, trade between European countries is to a very large extent intra-industry trade, i.e. driven by product differentiation within narrowly defined markets and not by differences in relative factor endowments, which are the basis of the traditional model.

Thus, to address the debate mentioned above, one needs a model that features labour market imperfections leading to unemployment and in which international trade is predominantly intra-industry trade. In this paper, we present such a model and show that, in contrast to the traditional view, labour market reforms in one country can also benefit its trading partners.

Ultimately, it is an empirical question as to whether our presented alternative is more appropriate than the traditional view. Therefore, we discuss the empirical evidence on this issue below. We show that labour market reforms do indeed tend to benefit not only the initiating countries but also their trading partners.

We then turn to political economy issues. The flip side of our results is that not only do labour market reforms benefit trading partners; at the same time, domestic policies that lead to excessive wage growth, and thereby to higher unemployment, hurt one's trading partners. In a way, a globalised world gives politicians the opportunity to spill over some of the adverse effects of labour market institutions to the country's trading partners. We show that this can lead to excessively high unemployment benefits.

The Traditional View

In this section we draw heavily on Davidson et al.² However, a similar argument can be found in Davis.³ Assume two countries, Home and Foreign, each endowed with capital and labour in different proportions but with identical technologies to produce two goods. The production of one of the two goods is relatively more capital-intensive. Both countries produce both goods, and unemployment exists in both countries due to search and matching frictions in the labour market.

The Nobel-Prize-winning search and matching model of Diamond, Mortensen and Pissarides is the most prominent way to model unemployment. Broadly speaking, the model is based on the idea that firms which want to hire new workers have to post vacancies. Filling these vacancies takes time and costs money. The rate at which vacancies are filled depends on the tightness of the labour market, which is defined as the ratio of vacancies to jobseekers. Naturally, the higher the number of vacancies, the lower the rate at which vacancies are filled, because the competition for each worker is more severe. For the jobseekers this is good news, because their chances of finding a job increase (and thus unemployment decreases).⁴

Let Home have the larger endowment of capital relative to labour. It therefore can produce the capital-intensive good more cheaply. It has a comparative advantage in the production of that good and so exports that good. Now assume a reform that reduces labour market frictions or unemployment benefits at Home. This increases employment at Home, the effective capital-labour ratio of the economy goes down and the country loses some of its comparative advantage in the capital-intensive good. Relative production of that good falls, and so does relative supply in the world market. This increases the relative price of Home's export good relative to its imports, i.e. its terms of trade go up.

In Foreign, where labour market institutions have not changed, the rise in the relative price of the capital-intensive good in the world market implies a deterioration of its terms of trade. Consequently, the labour-abundant

country reduces production of the labour-intensive good, thereby driving up unemployment. In this example, the correlation between Home's and Foreign's unemployment rates is negative. The reform lowers unemployment in Home but increases it in Foreign.

In this way, the traditional framework provides a rationale for the criticism of German labour market reforms discussed above. However, the traditional framework relies on comparative advantage, while trade between European countries is to a large extent intra-industry trade. Therefore, we will now discuss the same question within a framework that allows for intra-industry trade.

An Alternative View

To demonstrate the spillover effects of changes in labour market institutions in a model of intra-industry trade, we use a simple and tractable two-country model based on Felbermayr, Larch and Lechthaler.⁵ Both countries consume the home and foreign product. Hence the countries engage in international trade, exporting the domestic product and importing the foreign product. However, international trade is subject to trade costs, so that the foreign product is more expensive than the domestic product, all else equal. Consumers react by consuming relatively less of the foreign product, and the size of the home bias in consumption depends on the trade costs. If countries differ, for example with respect to their size, then, additionally to the trade costs, the terms of trade play a crucial role for the degree of international trade. Not surprisingly, the terms of trade do not only play a role for the determination of the degree of international trade but also for the unemployment rate. In fact, it is precisely through changes in the terms of trade that labour market reforms in one country affect unemployment in other countries.

Like Davidson et al.⁶ we use the search and matching framework to model unemployment. In the context of our model, this implies that unemployment is uniquely determined by labour market tightness θ , which is given by the following equation:

$$\theta_H = \left[1 + (\pi/\tau)^{\sigma-1} \right]^{\frac{1}{\mu(\sigma-1)}} \left(\frac{c_H}{m_H} \Omega_H \right)^{-1/\mu}$$

2 C. Davidson, L. Martin, S. Matusz: The Structure of Simple General Equilibrium Models with Frictional Unemployment, in: *Journal of Political Economy*, Vol. 96, No. 6, 1988, pp. 1267-1293; C. Davidson, L. Martin, S. Matusz: Trade and Search Generated Unemployment, in: *Journal of International Economics*, Vol. 48, No. 2, 1999, pp. 271-299.

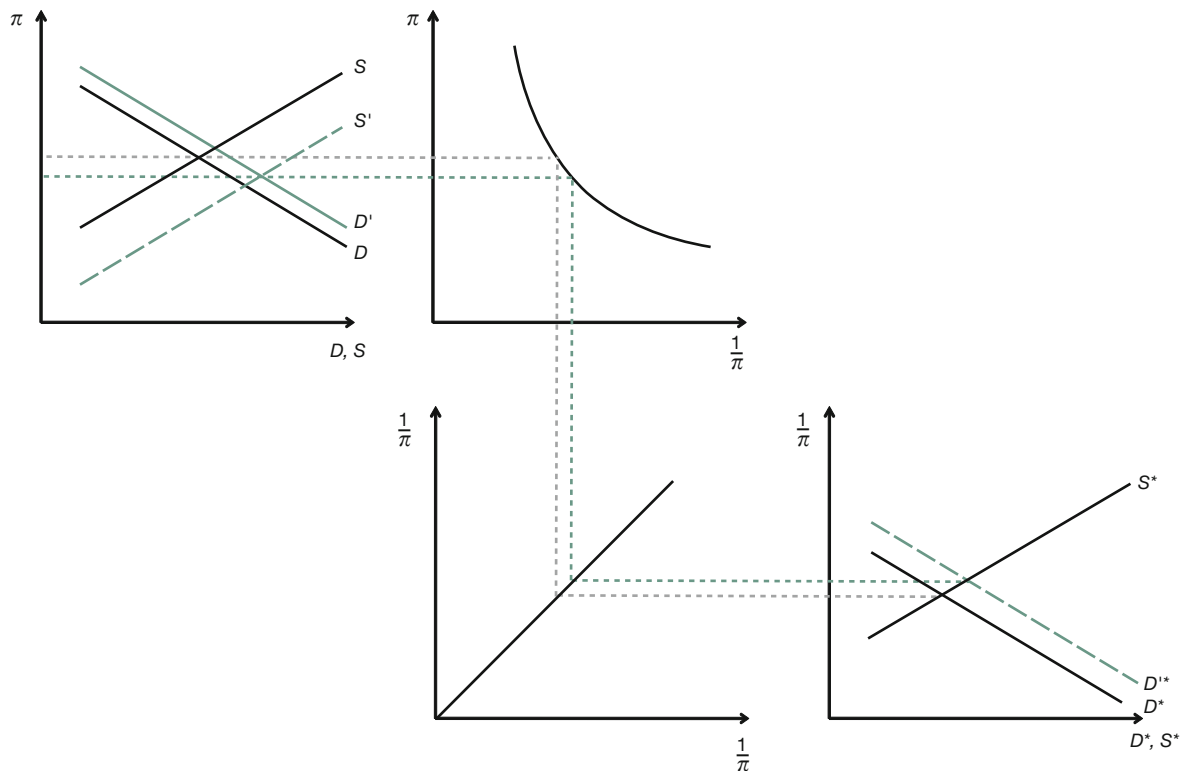
3 D.R. Davis: Does European unemployment prop up American wages? National labor markets and global trade, in: *American Economic Review*, Vol. 88, No. 3, 1998, pp. 478-494.

4 For a more detailed overview, see C. Pissarides: *Equilibrium unemployment theory*, Cambridge, Massachusetts 2000, MIT Press.

5 G. Felbermayr, M. Larch, W. Lechthaler: Unemployment in an interdependent world, in: *American Economic Journal: Economic Policy*, forthcoming.

6 C. Davidson, L. Martin, S. Matusz: The Structure of Simple..., op. cit.; C. Davidson, L. Martin, S. Matusz: Trade and Search Generated..., op. cit.

Figure 1
The Equilibrium of the Model and the Effects of a Reduction of Labour Market Frictions



where π denotes the home's terms of trade, τ denotes the trade costs, m measures the efficiency of the matching process, c are the costs of posting vacancies, and Ω summarises the effective bargaining power of workers, which in turn depends on the bargaining strength of workers and on unemployment benefits. The parameter σ measures the degree of substitutability between home and foreign products, and the parameter μ describes the relative importance of vacancies and jobseekers in the matching process.

It is immediately clear that an increase in Home's terms of trade π increases labour market tightness and thus decreases unemployment. The reason is that higher terms of trade make Home's firms more profitable. It pays off to post more vacancies and thus unemployment goes down. On the contrary, an increase in trade costs reduces the profitability of firms because the foreign demand for domestic products goes down. As a consequence, firms post fewer vacancies, and unemployment goes up. Naturally, an increase in the efficiency of the labour market reduces unemployment.

The equilibrium of the model and the effects of a reduction of labour frictions are depicted in Figure 1. The diagram in the upper left-hand corner shows demand (D) and supply (S) in the home country. We depict quantities on the x-axis and Home's terms of trade π on the y-axis. As usual, demand falls and supply increases as prices (i.e. the terms of trade) rise. The supply curve is fully determined by the labour market, while the demand curve depends on disposable income. The second diagram in the upper row transforms Home's terms of trade into Foreign's terms of trade ($1/\pi$). The diagram in the bottom right-hand corner depicts supply and demand in the foreign country, again with the demand (D^*) and supply (S^*) quantities on the x-axis and the price in Foreign ($1/\pi$) on the y-axis. Obviously, prices of goods in both countries depend on the terms of trade. Note that an increase in Home's terms of trade implies a decrease in the relative price of the foreign product and therefore a decrease in Foreign's terms of trade ($1/\pi$). In equilibrium the terms of trade are at a level which ensures that the markets in both countries are cleared. If, for example, Home's terms of trade were too high,

the supply of the domestic good would exceed the demand for the domestic good. Domestic firms would find it profitable to reduce prices in order to sell more. This puts downward pressure on the terms of trade until demand equals supply.

Next, suppose that the home country initiates a labour market reform which increases the efficiency of the labour market. This could, for example, be the Hartz IV labour market reforms in Germany, which led to a considerable degree of wage moderation. This kind of reform makes labour cheaper and thus allows firms to supply more for a given price. In other words, the supply curve shifts right (see the line denoted by S'). This reduces unemployment but deteriorates the terms of trade.

Naturally, this kind of policy has implications for demand in the foreign country as well. The increase in employment in the home country increases GDP and thus the available income. This increases demand not only for the domestic product but also for the foreign product. The terms of trade have to adjust in order to bring the economies back into equilibrium. In our example, this can only be achieved by a decrease in Home's terms of trade. For the foreign country this is good news, because its terms of trade are the inverse of the home country's terms of trade and thus increase. This implies a comparative advantage for foreign firms. Their profitability increases, and unemployment goes down. This is the channel through which labour market reforms in one country affect labour market outcomes in its trading partner countries: demand for all products goes up, the trading partners' terms of trade improve, and thus unemployment goes down both in the home country and in the foreign country. Note that for the home country, the country initiating the labour market reform, terms of trade movements are not beneficial. For the home country, the terms of trade deteriorate, thereby increasing unemployment and thus counteracting the effects of the labour market reform. However, although the terms of trade effect diminishes the positive effects of labour market reform in the initiating country, the effect cannot exceed the direct effect, and thus unemployment unambiguously goes down in both countries.

Thus, our simple model yields results which are in stark contrast to the popular belief that the Hartz IV reforms in Germany hurt its European partners. On the contrary, a reform in one country should benefit its trading partners. While such a simple model is useful in structuring thoughts and in providing an intuition for spillover effects, its implications certainly have to be

validated to be taken seriously for policy analysis.⁷ We do this in the following section.

Empirical Evidence

While the importance of intra-industry trade for intra-EU commerce is well established, there has been no empirical test in the literature on how labour market institutions in one country affect labour market outcomes in other countries. The answer to this question is not easy, since comparable data on unemployment rates is rare.

Nonetheless, a large body of empirical literature has investigated the role of labour market institutions for aggregate unemployment rates in panels of OECD countries. Determinants investigated include unemployment benefits, wage taxes, measures of union density and coverage, indicators of real wage flexibility, indicators of the strictness of employment protection legislation and the degree of corporatism.⁸ Recent literature argues that the sum of the replacement rate and wage taxes, i.e. the so-called tax wedge, is most relevant for explaining the cross-sectional and time variation of unemployment rates.⁹ A key challenge in these models is to make sure that one does not report spurious results: for example, it is very well possible that the tax wedge moves up in recessions due to budgetary pressure, while at the same time unemployment is high for the same reason. This creates a positive correlation between the tax wedge and unemployment that is driven by the business cycle rather than by the institutions themselves.

Using very similar models, there are also a number of papers that study the effect of trade openness on

7 See G. Felbermayr, M. Larch, W. Lechthaler: The Shimer-puzzle of international trade: A quantitative analysis, Ifo Working Paper No. 134, 2012, which builds on the influential work of M.J. Melitz: The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity, in: *Econometrica*, Econometric Society, Vol. 71, No. 6, 2003, pp. 1695-1725, providing a richer model that allows for heterogeneous firms and the selection of the most efficient firms into exporting. This gives rise to additional transmission channels. However, it is shown that this only reinforces the effects described here.

8 See S. Nickel, L. Nunziata, W. Ochel: Unemployment in the OECD since the 1960s. What do we know?, in: *Economic Journal*, Vol. 115, No. 500, 2005, pp. 1-27, for a prominent example.

9 See J. Costain, M. Reiter: Business cycles, unemployment, and the calibration of matching models, in: *Journal of Economic Dynamics and Control*, Vol. 32, No. 4, 2008, pp. 1120-1155.

Table 1
Foreign Labour Market Institutions and Domestic Unemployment

	(1)	(2)	(3)	(4)	(5)
Domestic tax wedge	0.093	0.071	0.081	0.059	0.063
	(0.019)	(0.017)	(0.017)	(0.014)	(0.016)
Foreign tax wedge			0.009	0.016	0.015
			(0.003)	(0.003)	(0.003)
Openness		-0.059		-0.082	-0.060
		(0.017)		(0.016)	(0.015)
Adjusted R ²	0.930	0.933	0.923	0.932	0.935
No. of observations	397	397	397	397	397

Note: Robust standard errors in parentheses.

Source: G. Felbermayr, M. Larch, W. Lechthaler: Unemployment in an interdependent world, in: American Economic Journal: Economic Policy, forthcoming.

the equilibrium level of unemployment rates.¹⁰ These papers devote a lot of effort to account for the possibility of reverse causation, i.e. that unemployment affects openness, rather than the other way around. This would be likely if governments were to resort to protectionist measures in times of high unemployment. Fortunately, using appropriate econometric techniques, it is possible to isolate the component of openness that is independent of the unemployment rate. The empirical findings suggest that, on average, in the long run, openness to international trade does not increase unemployment but rather decreases it.

The key question in the context of this article is how *foreign* labour market institutions affect *domestic* labour market outcomes. In our recent work, we offer an answer.¹¹ To this end, we construct “foreign” variables for each country. This is done by computing averages across trading partners using weights reflecting the relative importance of bilateral trade with each partner.

Using OECD data on harmonised unemployment rates and labour market institutions for 20 countries over the years 1975-2005, we carry out panel regressions of domestic unemployment rates on domestic and foreign institutional variables and a host of other controls.

10 See P. Dutt, D. Mitra, P. Ranjan: International trade and unemployment: theory and cross-national evidence, in: Journal of International Economics, Vol. 78, No. 1, 2009, pp. 32-44 or G. Felbermayr, J. Prat, H.-J. Schmerer: Trade and unemployment: What do the data say?, in: European Economic Review, No. 55, 2011, pp. 741-758.

11 G. Felbermayr, M. Larch, W. Lechthaler: Unemployment in an interdependent world..., op. cit.

The panel dimension of the data set is useful, because it allows us to account for determinants of unemployment rates across countries that do not change over time. This reduces the scope for biased estimates. Moreover, we carefully control for the business cycle influence on unemployment.

The results of the regression are reported in Table 1.¹² The dependent variable is the domestic unemployment rate. All coefficients shown are statistically significant at the 1% level. For the sake of simplicity, we have omitted all other variables included in the model that are not directly relevant for our argument in this article.

Column (1) reproduces a standard unemployment model similar to Nickel et al.¹³ The domestic tax wedge positively affects the equilibrium unemployment rate. Increasing that wedge by one standard deviation increases the unemployment rate by 1.7 percentage points. This finding is in line with the existing literature. Regression (1) includes four further domestic labour market measures, the output gap, a non-parametric time trend and an array of macroeconomic shock variables (not shown in the table).

Column (2) adds a measure of trade openness (exports plus imports divided by GDP). It finds that openness lowers unemployment. The estimated coefficient implies that a one standard deviation increase in openness lowers unemployment by about 1.8 percentage points.

The remaining columns in Table 1 include foreign institutions. Column (3) offers a very parsimonious specification which includes the domestic and “foreign” tax wedges as the only labour market characteristics. Since the standard deviations of the domestic and “foreign” tax wedges are of similar size, this finding implies that the effect of the foreign tax wedge on domestic unemployment is about one-tenth of the effect of the domestic tax wedge. This finding is robust and holds across alternative specifications.

Column (4) adds the openness measure and column (5) offers a rich specification that includes a long list of additional variables (not shown). Our key finding remains unchanged: a higher foreign tax wedge increases domestic unemployment. Our research highlights two additional findings not shown in Table 1: first, the tax

12 Table 1 provides a simplified version of Table 2 in: G. Felbermayr, M. Larch, W. Lechthaler: Unemployment in an interdependent world..., op. cit.

13 See S. Nickel et al., op. cit.

wedge is not the only variable for which international labour market linkages can be empirically established. A similar spillover result can be shown for union density. Second, to test the comparative advantage argument of Davidson et al.¹⁴ or Davis,¹⁵ we include measures of countries' relative endowment of capital and labour. If comparative advantage arguments are correct, one would expect that a higher foreign tax wedge increases domestic unemployment less if the foreign country is relatively more capital-abundant than the domestic country. This is, however, not what we find; if anything, we find the opposite pattern in our regressions.

Additionally, we find that labour market spillovers are stronger in larger reforming countries and that higher trade costs decrease the importance of spillovers, i.e. the more integrated two economies are in terms of trade, the more their labour markets depend on each other. Concerning the size of spillovers, wage rigidities are a crucial factor. Higher wage rigidities lead to larger unemployment spillovers.

A Case for Coordination

Our discussion, as well as the empirical evidence reported in the last section, suggests that when countries reform their labour market institutions, they exert a positive externality on their trading partners. To the extent that labour market policies are not coordinated internationally, these externalities imply that there will be too little reform. Rather than holding reformist countries responsible for bad domestic labour market outcomes, countries should coordinate to carry out ambitious reforms.

In the absence of coordination, there is another interesting implication of our theoretical arguments: countries will naturally differ with respect to the generosity of labour market institutions such as the replacement rate. The reason is that smaller countries rely relatively more on foreign markets both for their imports and their exports than larger countries do. This means that a labour market reform in a small country affects the size of the market for its exports only marginally, the increase in the size of the home market being relatively small. This is different in large countries, and it follows that large countries have stronger incentives to reform than small ones do. Or, in other words, one should observe

more generous labour market institutions in small as compared to large countries. In Felbermayr, Larch, and Lechthaler¹⁶ we confirm this prediction using a more complicated model and numerical simulations.

In this context and in the presence of international trade, countries will choose labour market institutions that are inefficiently generous from the world's perspective, since high replacement rates harm not only domestic labour market outcomes but foreign ones as well. This is particularly true for small open economies. This argument provides a new rationale for the widely cited negative correlation between country size and the magnitude of the welfare state (or redistribution), which is traditionally based on the argument of economies of scale in supplying public goods in large countries.¹⁷

Conclusion

In summary, contrary to the popular view that labour market reforms constitute a beggar-thy-neighbour policy, empirical evidence suggests that domestic labour market reforms reduce not only the domestic unemployment rate but also the unemployment rate of trading partners. If a country lowers the average tax wedge by one standard deviation, foreign unemployment falls by 0.16 percentage points, on average. This is about one-tenth of the effect on its own economy, but the magnitude is sizeable enough, especially when compared to many classical determinants of unemployment, such as domestic measures of union density or wage flexibility, which do not at all affect labour market outcomes in a robust way. Thus, our analysis does not confirm the view that the Hartz IV reforms hurt Germany's European trading partners.

The simplest mechanism explaining our finding is that labour market reforms, while boosting employment, do reduce the reforming country's terms of trade. This benefits the country's trading partners, whose terms of trade increase, leading to improved labour market outcomes there as well. Note, however, that these spillover effects of labour market reforms reduce the incentives to reform and thus tend to lead to excessively high unemployment benefits. International policy coordination is called for to overcome this externality.

14 C. Davidson, L. Martin, S. Matusz: The Structure of Simple..., op. cit.; C. Davidson, L. Martin, S. Matusz: Trade and Search Generated..., op. cit.

15 D.R. Davis, op. cit, see Section II.

16 G. Felbermayr, M. Larch, W. Lechthaler: Endogenous labor market institutions in an open economy, in: *International Review of Economics and Finance*, No. 23, 2012, pp. 30-45.

17 See A. Alesina, R. Wacziarg: Openness, country size and government, in: *Journal of Public Economics*, Vol. 69, No. 3, 1998, pp. 305-321.