The Effects of Globalization on Wage Inequality: New Insights from a Dynamic Trade Model with Heterogeneous Firms

Working Paper no 49

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December 2013

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Reviewed by: Karl Pichelmann (European Commission)

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Work Package 101

MS4 "Policy paper on the winners and losers of globalisation"

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Contribution to the Project

This policy paper provides an overview of the likely winners and losers of globalization. It focuses on the dynamic labor market effects of globalization on wage inequality.

The Effects of Globalization on Wage Inequality:

New Insights from a Dynamic Trade Model with Heterogeneous Firms

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6. December 2013

Abstract:

Fears of increasing inequality play a dominant role in current debates on how globalization is affecting our economies. After a brief review of recent trends in wage inequality, this policy paper presents new insights on the dynamic effect of trade liberalization on wage inequality. In the context of a dynamic trade model with costly labour mobility (Lechthaler and Mileva, 2013), we show that the effect of trade liberalization on wage inequality depends on i) the time horizon considered, ii) the degree of worker mobility, and iii) the degree of trade liberalization (partial/full). In the short-run, observed increases in wage inequality are driven by an increase in inter-sectoral wage inequality, while in the long run, wage inequality is driven by an increase in the skill premium.

1. Introduction

There is broad agreement among economists that economic globalisation, broadly defined as the process of integrating national economies into a world economy or a single marketplace, creates aggregate net benefits to society. Yet, there is also broad agreement that the globalisation process will harm some groups in society (while benefiting others), with the labour market outcomes of the losers of globalisation being a particular source of anxiety. In addition, the aggregate benefits of globalisation might only be realized after costly adjustment processes, involving, for example, temporary job losses. Although the adjustment costs of globalisation Figure prominently in the public debate on globalisation, we know surprisingly little about their magnitude. This policy paper summarizes new insights from a dynamic trade model on the adjustment costs of globalization and on the short-, medium- and long-run effect of globalization on wage inequality.
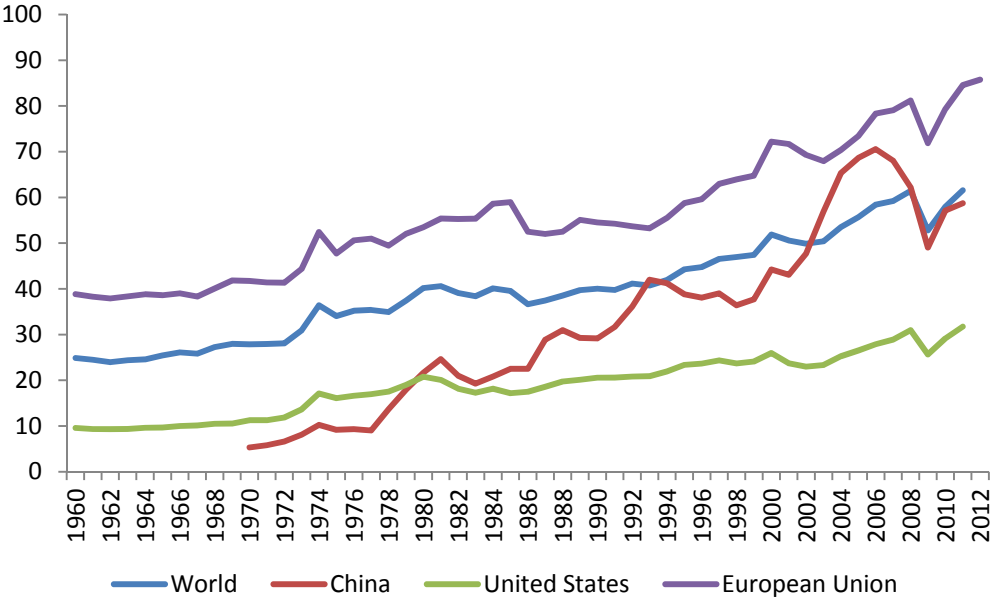
Global Trade and its Discontents

The globalisation process has dramatically increased the importance of international trade. In the last half century, total world trade as a percentage of global GDP more than doubled from 24.9 per cent in 1960 to 61.6 per cent in 2011 (see Figure 1). In 2012, imports and exports of the European Union (EU) amounted to as much as 85.9 per cent of its GDP. Even the Global Financial Crisis could only temporarily halt the steady increase in international trade. New information and communication technologies and falling transport costs have also changed the *nature* of international trade. While for centuries, countries traded mainly final products or raw materials, trade now increasingly involves bits of value being added in many different locations around the globe. Many firms unbundle production stages and offshore production processes to foreign suppliers.

The on-going globalisation process has sparked a significant policy debate in developed countries about the associated effects on inequality. While a majority of Europeans believes that globalisation "is an opportunity for economic growth", there is also widespread fear that the benefits of globalisation are not shared equally in society. In fact, 60 per cent of Europeans think that globalisation increases "social inequalities" (Eurobarometer, 2010). This fear of rising inequality is shared in other parts of the world: According to the results of a BBC opinion poll, majorities in 27 out of 34 countries, and 64 per cent of all respondents, hold the view that the benefits and burdens of "the economic developments of the last few years" have not been shared fairly. Fears of rising income inequality, the OECD Secretary-

General Angel Gurria concluded, "are probably the single most important concern put forward by those who argue that we should resist the increased integration of our economies" (OECD, 2008: p. 3).

Figure 1: Trade (imports and exports) in per cent of GDP, 1960-2012

Source: World Development Indicators (2013)

Of particular concern in the public discussion in developed countries is the increasing competition from low-wage economies, and especially from China. While economically isolated until the late 1970s, China is now the worlds' biggest exporter. International trade between the EU and China, in particular, has increased dramatically in recent years. Today, China is the EU's second biggest trading partner (behind the US) and by far the EU's biggest source of imports.[1] Many observers in Europe and the US have linked the growing volume of imports from China (and other low-wage countries) to a fall in (relative) wages and employment of low-skilled workers – and thus to an increase in wage inequality. Moreover, a commonly held belief is that offshoring to low-wage countries will hurt low-skilled workers.
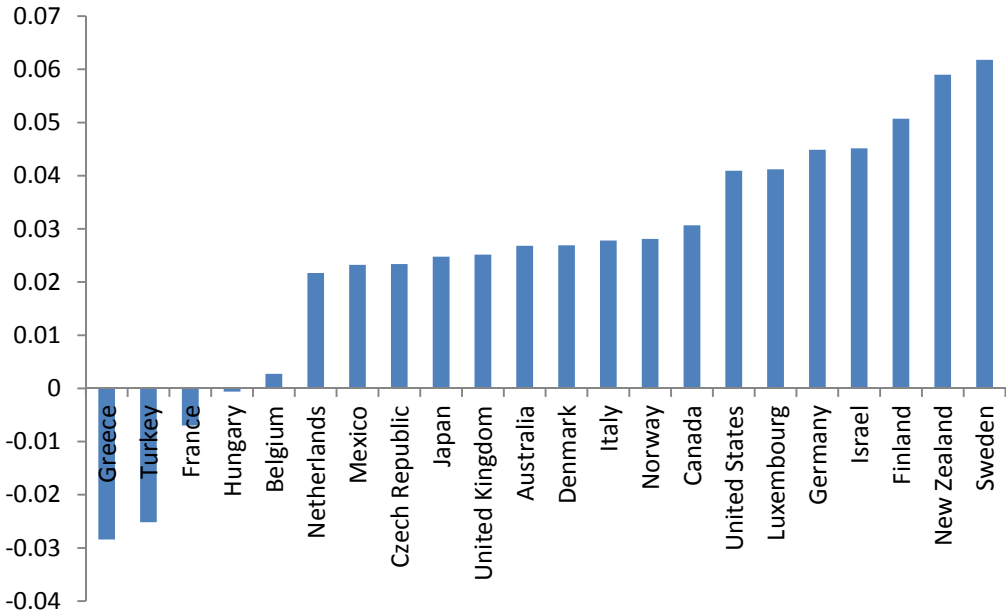
Trends in Inequality

The empirical evidence indeed suggests that, at a time of rapid globalisation, the world has grown more unequal. Since at least the mid-1980s, overall inequality in disposable household income in cash (after transfers and taxes) has increased in most OECD countries (see Figure

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[1] In 2012, 16.5 per cent of all imports to the EU came from China, followed by Russia (11.9 per cent) and the USA (11.5 per cent).

2). The evidence also shows that the exact magnitude of the increase has differed a lot across countries. Interestingly, both Anglo-Saxon countries, such as the US, and Continental European countries, such as Germany or Italy, have experienced a marked increase in inequality – despite their different institutional settings. Only in Greece, Turkey and France did inequality decrease since the mid-1980s.

Figure 2: Change in Income Inequality (Gini Coefficient) in OECD Countries, Mid-1980s to End-2000s

Source: OECD Database on Household Income Distribution and Poverty.
Notes: The Gini coefficient is one of the best known measures of inequality. Its values range between 0, in the case of "perfect equality", and 1, in the case of "perfect inequality". The income concept used is disposable household income in cash after transfers and taxes, adjusted for household size.
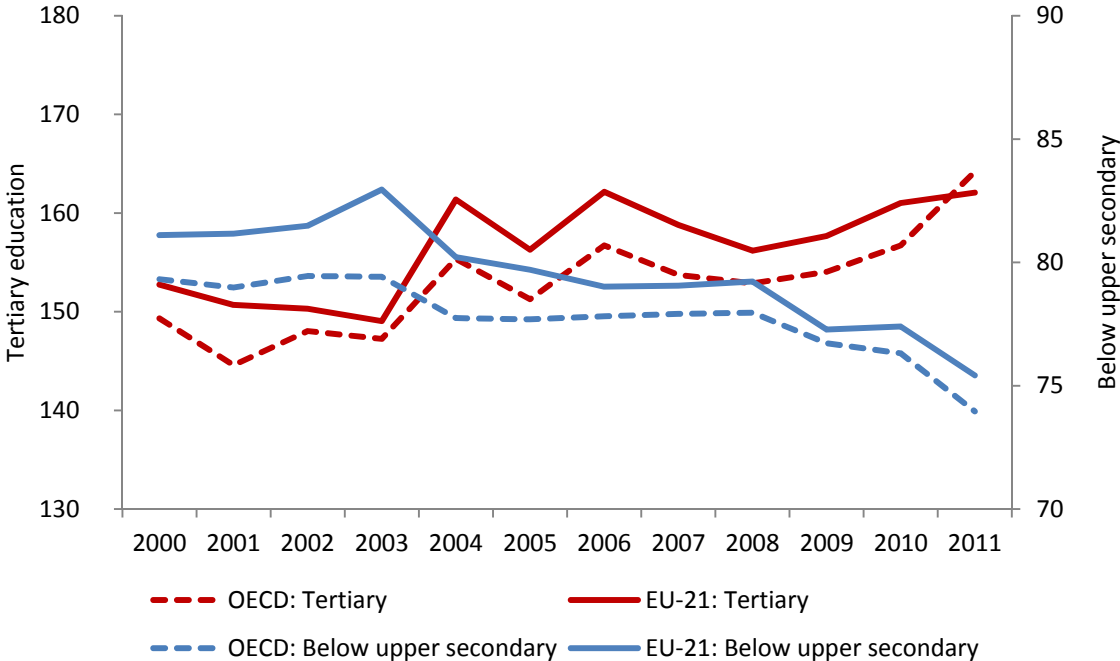
The observed increase in household income inequality is largely due to changes in the wage distribution (OECD 2008, 2011). In almost all OECD countries, gross wages grew much faster at the top than at the bottom of the wage distribution. The distribution of capital income and income from self-employment has also grown more unequal over time. While income taxes and cash transfer partly offset the rise in income inequality from the mid-1980s to the mid-1990s, redistributive government expenditures became less effective in reducing income inequality since the late 1990s.

In many countries, increases in wage differentials *between* occupational, demographic and skill groups have significantly contributed to the increase in inequality. Figure 3 shows that in EU and OECD countries, despite the recent trend toward higher education, the earnings of low-skilled workers (defined as those with below upper secondary education) in employment decreased relative to the earnings of medium-skilled workers (with upper secondary or post-

secondary non-tertiary education) between 2000 and 2011. At the same time, the earnings of high-skilled workers (with tertiary education) have increased relative to medium-skilled workers. There is also some evidence for a polarization of the labour market since the 1990s, with the relative employment shares of low- and high-wage jobs increasing in tandem at the expense of middle-wage jobs.[2] Goos, Manning and Salomons (2009), for instance, show for 16 European countries that the employment shares of managers, professionals and low-paid personal services workers increased between 1993 and 2006 at the expense of the employment shares of middling manufacturing and routine office workers (see Figure 4). However, the employment shares increased much faster at the top than at the bottom of the wage distribution.

Wage differentials did not only increase *between* but also *within* demographic and skill groups. For instance, Autor et al. (2008) find for the US that increasing earning differentials within demographic groups (defined by age, education and gender) are a key driver of wage inequality both at the lower and upper tail of the wage distribution. For Germany, Dustmann et al. (2009) find that the majority of the increase in wage inequality, observed since the 1990s, occurred within age and education groups.

Figure 3: Relative earnings of 25-64 year-olds, by educational attainment, 2000-2011
(Upper secondary or post-secondary non-tertiary education = 100)
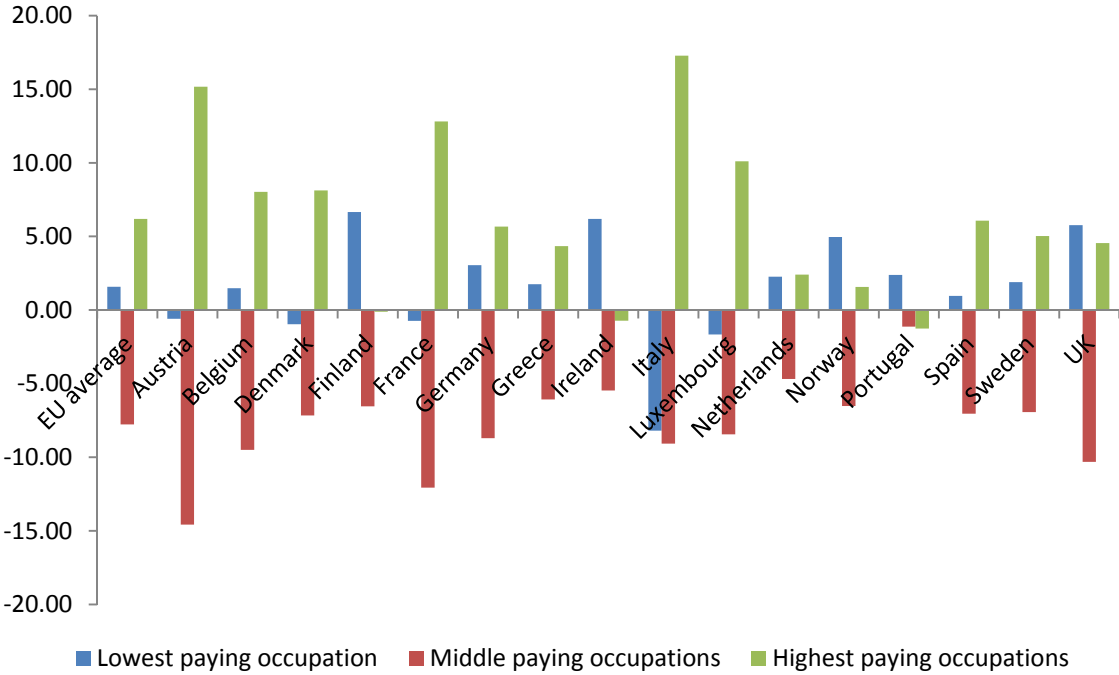

Source: OECD (2013)
Notes: Earnings net of income tax. OECD averages cannot be compared throughout the years as the number of countries used to calculate those averages is different every year.

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[2] See Author et al. (2003, 2008) for the US evidence and Spitz-Oener (2006) for the German evidence.

Figure 4: Changes in Shares of Hours Worked for High-, Middle-, and Low-Paying
Occupations, 1993-2006

Source: Goos, Manning, and Salomons (2009)

Does Trade Increase Inequality?

How much did the increase in international trade contribute to the observed increase in (gross) wage inequality? The answer to this question is disputed among economists. Standard Heckscher-Ohlin trade theory indeed predicts that increased trade between high-skilled labour-abundant countries, such as the US or EU member countries, with low-skilled labour–abundant countries, such as China or India, should decrease relative wages of low-skilled workers in the high-skilled labour-abundant countries. Hence, increasing EU trade with China should decrease the relative wages of European low-skilled workers. However, empirical evidence from the 1990s suggested that factors other than trade, in particular skill biased technical change (SBTC), played a more important role in explaining the evolution of the wage structure in developed economies (see, e.g., Katz and Autor, 1999, for the US). The SBTC hypothesis holds that technological innovation – and especially the development of microcomputers – have increased the demand for highly skilled workers and have therefore led to an increase in earnings inequality.

In the 1990s, however, trade volumes between high- and low-wage countries were still comparably small. Trade with China was therefore simply not important enough to significantly affect the wage structure of developed economies. Given the recent surge in

imports from emerging economies, the evidence might have to be re-assessed (Krugman, 2008). In fact, Autor et al. (2013). have recently shown that rising imports from China significantly increase unemployment, decrease labor force participation and reduce wages in those local US labour markets, in which import-competing manufacturing industries are located.The size of the effects is considerable: In their preferred empirical specification, the authors find that rising imports from China explain one-quarter of the observed decline in U.S. manufacturing employment.

Trade economists usually rely on static general equilibrium models, and most importantly on the Heckscher-Ohlin framework, to analyse the effects of international trade on labour markets and wage inequality. These models intend to describe long-run relationships, a fact also reflected in the models' assumptions (see, e.g., Davidson and Matusz, 2006a). The Heckscher-Ohlin model, for instance, assumes that workers are perfectly (and painlessly) mobile across sectors. In reality, of course, workers can neither move instantaneously nor painlessly between firms, occupations or sectors. Trade-induced labour reallocation, even if beneficial in the long-run, might thus be costly in the short- to medium-run. For example, increased competition from low-wage countries might very well lead to temporary job loss or might force workers to switch jobs or retrain. Such "adjustment costs" may differ across workers and form an important part of the overall welfare costs of globalization. As the short- and long-run effects of international trade are likely to differ, the overall effect will crucially depend on the length of the adjustment process. This policy paper will summarize new insights from a recent research paper of ours (Lechthaler and Mileva, 2013) that analyses the *dynamic* effects of international trade on wage inequality. The paper explicitly accounts for the adjustment costs of globalization and studies the short-, medium-, and long-run effects of international trade on wage inequality.

The rest of the policy paper is organized as follows. Section 2 briefly describes insights from the small existing literature on the dynamic effects of trade liberalization. Section 3 describes the framework of analysis in Lechthaler and Mileva (2013). Section 4 presents the results while Section **Fehler! Verweisquelle konnte nicht gefunden werden.** concludes.

2. Existing Studies on the Dynamic Effects of Trade Liberalization

Most of the extant trade literature relies on static models, in which workers are assumed to be either instantly costlessly mobile, or perfectly immobile. However, the economy is unlikely to change over-night and we need adjustment dynamics in order to quantify how painful and

protracted dynamic adjustment is after a trade liberalization episode. Thus, a short-run and medium-run analysis is missing. Recent papers on dynamic models of international trade intend to fill this gap in the literature by studying the transition path of labour market adjustment as a consequence of trade liberalization. By studying short- and medium-run dynamics, these papers are able to analyse the transitional dynamics of the reallocation of labour in the face of barriers to mobility as well as the distributional and efficiency effects of trade liberalization.

In his analysis of labour reallocation following trade reform, Coşar (2013) calibrates a dynamic two-sector, small open-economy model with overlapping generations, labour market search and matching, and sector-specific human capital accumulated through learning by doing. The model predicts that the labour market adjusts only very slowly to a trade-induced price shock in one sector. Coşar (2013) then shows that the main factor accounting for the slow adjustment is sector-specific experience. Importantly, in his model, sector-specific experience is not transferrable across sectors. Workers who switch sectors start their new jobs with no sector-specific experience.

In a related study, Dix-Carneiro (2011) studies the short- to medium-run response of the labour market to trade-induced sector price changes. He estimates a structural dynamic general equilibrium model of the Brazilian labour market, featuring a multi-sector economy with overlapping generations, heterogeneous workers, endogenous accumulation of sector-specific experience and sector-switching costs. In contrast to Coşar (2013), Dix-Carneiro (2011) allows for sector-specific experience to be transferrable across sectors, though imperfectly, with the degree of transferability being estimated based on Brazilian data. He conducts a number of counterfactual experiments where the price of the import-competing sector (named High-Tech Manufacturing) faces a once-and-for-all decline in order to simulate a trade liberalization episode. He finds that there is a sizeable adjustment in the labour market following trade reforms. Workers, who were employed in the import-competing sector right before the trade shock, face substantial welfare losses. Employment in High-Tech manufacturing drops to zero in the long run and the price shock in this sector is big, causing workers as well as capital to reallocate elsewhere. This result is based on the major assumption of perfectly mobile physical capital.

Chaudhuri and McLaren (2007) develop a dynamic stochastic rational expectations model of workers facing time-varying idiosyncratic moving costs. The model generates gross flows of workers across industries, even in the steady state, and predicts that persistent wage

differentials are evident across industries. The authors also find that the labour market adjusts gradually to trade liberalization and that the pre-announcement of trade reforms makes liberalization less attractive to export-sector workers and more attractive to import-sector workers. In addition, trade liberalization lowers the long-run wage in the import-competing sector relative to the export sector.

That inter-industry reallocation entails costs is well-studied in the literature. Kambourov (2009) contends that in the presence of regulated labour markets with high firing costs, the inter-sector reallocation of labour after a trade reform is slowed down. He builds a dynamic general equilibrium multi-sector model of a small open economy with sector-specific human capital, firing costs, and tariffs in order to understand the effect of labour market regulations on the effectiveness of trade reforms. Calibrating the model for Chile, Kambourov (2009) performs counterfactual simulations and finds that if Chile did not liberalize its labour market at the outset of its trade reform, then the inter-sector reallocation of workers would have been 30 per cent slower and as much as 30 per cent of the gains in real output and labour productivity in the years following the trade reform would have been lost.

Artuç, et al. (2010) investigate the implications of moving costs on job reallocation and wages following trade liberalization. They specify a dynamic structural equilibrium model of inter-sectoral labour adjustment and estimate structural parameters for US data. They obtain very high average moving costs, and a very high standard deviation of costs on moving from one broadly aggregated sector of the economy to another. These costs suggest sluggish adjustment of the labour market to a trade shock, with the economy requiring several years to approach the new steady state. The sluggish labour market adjustment, in turn, implies sharp movement of wages in response to trade liberalization, with the short-run response overshooting the long-run response by a wide margin. In their simulations, wages in sectors hit by trade shocks fall both in the short run and in the long run. Artuç, et al. (2010) emphasize that a workers' net benefits from liberalization depend much more on the sector she is employed in than on her education.

The existing literature discussed so far has at least two important limitations. First, it is restricted to small-open economy settings. Therefore, the studies cannot account for shifts in relative prices resulting from trade between large developed and developing countries. Second, the assumption that workers are perfectly immobile is only partially relaxed. Workers can move across industries (even though they face moving costs), but they are strictly immobile between skill-classes. Relaxing this assumption and allowing workers to

invest in their sector-specific human capital has important implications for the dynamic adjustment path after globalization.

3. Model description

We build a dynamic model[3] featuring comparative advantage and firms that are heterogeneous with respect to their productivity. The model includes two countries, a developed and a developing country, and two production factors, high-skilled and low-skilled labour.[4] Production factors are assumed to be complements, i.e., low-skilled workers become more productive if combined with more high-skilled workers, and vice versa.

The economy of each country consists of two sectors and each sector produces a final good. While the production of each good requires the input of both high-skilled and low-skilled labour, the importance of both factors differs between sectors. We call the sector, for which high-skilled labour is more important, the skill-intensive sector. We refer to the other sector as the low-skilled-intensive sector. Finally, we allow for trade between the two countries. The two countries are very similar but they differ in one important aspect, namely in their relative endowment of high-skilled labour. The developed country (e.g., Germany) is relatively more endowed with high-skilled labour, while the developing country (e.g., China) is relatively more endowed with low-skilled labour. This difference in relative endowments determines a country's comparative advantage. Germany, where high-skilled labour is relatively abundant, has its comparative advantage in producing the skill-intensive product. China, where low-skilled labour is relatively abundant, has its comparative advantage in producing the low-skilled-intensive product.

Under autarky, each country consumes its own production of the two goods. In contrast, trade allows a country to specialize in the production of the good which it can produce relatively more efficiently.[5] It then trades it for the other good. Therefore, free trade improves the efficiency of production and leads to higher welfare in both countries. This mechanism is well understood in the trade literature. However, the welfare gains are based on an important

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[3] The advantage of using a model-based approach is that this allows us to run a number of controlled experiments. We can, for instance, analyse the impact of trade negotiations that affect the whole economy or just specific sectors. We can also analyse the role of workers' mobility across sectors as well as training opportunities. Finally, a theoretical model enables us to simulate different variations of policy responses that try to help the losers of globalization (before these policies are actually implemented).

[4] We develop a dynamic version of Bernard, et al. (2007).

[5] Note that our model does not feature full specialization as both countries produce both goods. However, the home country produces relatively more of the skill-intensive good while the foreign country produces relatively more of the low-skilled-intensive good.

assumption, namely that workers are perfectly mobile across sectors. In practice, worker mobility is often very limited.

To analyse the implications of mobility restrictions, we set up a dynamic model. The model explicitly accounts for adjustment problems and simulates the adjustment process after trade liberalization.[6]

In our analysis, we focus on the effects of trade liberalization on wage inequality in the rich country. We mainly concentrate on two sources of wage inequality, the wage differential between workers who are in the same skill class but in different sectors, and on the skill premium, i.e., the wage differential between high-skilled and low-skilled workers. We also construct a theoretical GINI Index, which measures economy-wide wage inequality, and accounts for both sources of wage inequality. We then study which source of wage inequality - wage differentials between sectors or between skill groups - are most important for the evolution of the GINI index in the short run and in the long run.

4. Results

Training and inequality

Our results indicate that the ease at which workers can move between sectors is crucial for the effects of trade liberalization. In line with empirical evidence from Artuç et al. (2010), we assume that low-skilled workers are more mobile across sectors than high-skilled workers. The reason is that high-skilled workers have invested more in sector-specific skills which cannot be easily transferred to other sectors. In contrast, low-skilled workers who have lower human capital suffer less from these constraints. Note that we focus on mobility between sectors, not between regions. In terms of geographical mobility, high-skilled workers are often more mobile than low-skilled workers.

To highlight the role of human capital, we further distinguish between two scenarios. In the first scenario, we follow the popular assumption that the number of high-skilled workers and the number of low-skilled workers are fixed. In other words, there is no possibility for low-skilled workers to invest in their human capital to become high-skilled workers. In a second scenario, we relax this assumption and allow for training.

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[6] Adjustment dynamics in our model stem from two sources: reallocation of firms and reallocation of workers. Newly entering firms need to invest in a specific sector and are bound to that sector for their life-time. Thus, reallocation of firms takes place only via firm turnover. Workers who want to switch sectors have to pay randomly distributed sector-switching costs. Only those workers with sufficiently low switching costs decide to switch sectors.

Let us first focus on the scenario without training. Figure 5 shows how various measures of wage inequality evolve over time after a trade agreement that lowers the barriers to trade equally in all sectors and for all countries. It can be seen that inequality unambiguously increases. The GINI index rises strongly and persistently. In the post-liberalization steady state it is 5.6 % higher than in the pre-liberalization steady state. Figure 6 shows that 10 years after China's accession to the WTO in 2001 the Gini coefficient increased for a selection of developed countries. The increase ranges from 3.3 % for the UK to 6.5 % for the US.[7] Our model predicts that 10 years into the transition the Gini will rise by 2 %. Our model results therefore suggest that on average one third of the increase in inequality observed in developed countries could be attributed to liberalization of trade with emerging economies. Note that our model also predicts that the Gini coefficient will rise further in the future (though slowly). In the short run, the increase in inequality is driven by a rise in the wage differential between the skill-intensive and the low-skilled-intensive sector. In the medium to long run, wage inequality rises due to the rising skill premium in the exporting sector.

Falling trade barriers cause demand to increase in the comparative advantaged sector relative to the comparative disadvantaged sector, because each country specializes more in the production of the good which it can produce relatively more efficiently. As a result, both high-skilled and low-skilled workers get relatively higher wages in the exporting than in the import-competing sector. This suggests that workers in the comparative advantaged sector benefit relative to the workers in the comparative disadvantaged sector. Note, however, that there are important differences between the skill classes: the wage differential between sectors increases strongly and persistently for high-skilled workers, while it jumps up but then recedes very fast for low-skilled workers.

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[7] Of course, this simple comparison does not proof that the whole increase in wage inequality can be attributed to increased trade with China, but it fits well to the results in Autor et al. (2013).

Figure 5: The Effects of Full Liberalization on Wage Inequality, No-Training Scenario
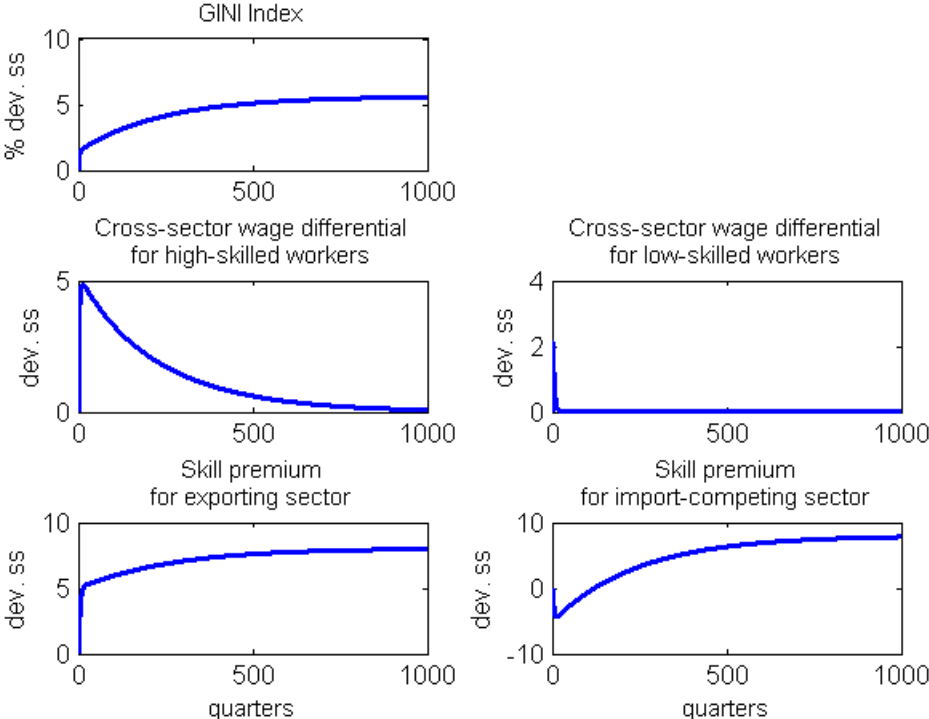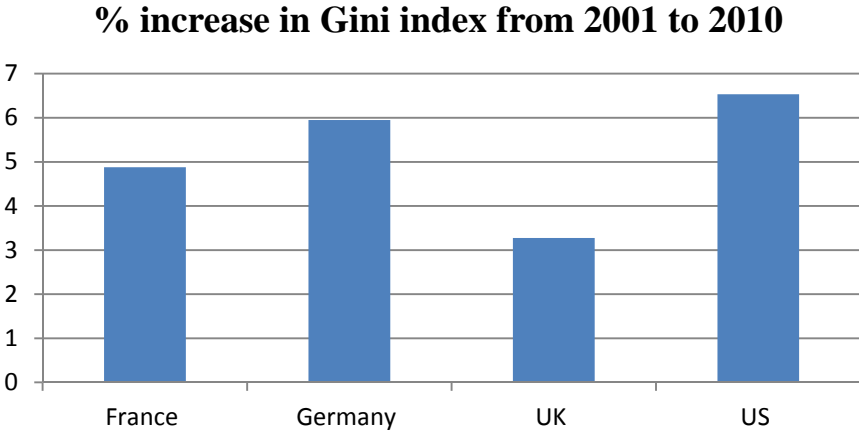

Figure 6: Change in Gini Index after China Accession to WTO in 2001

% increase in Gini index from 2001 to 2010

Source: author's calculations based on OECD data.

The reason is that low-skilled workers are more mobile and thus react more strongly to sector wage differentials. As the demand in the exporting sector goes up, low-skilled workers quickly move from the import-competing sector to the exporting sector. This increases the supply of low-skilled workers in the exporting sector, reducing the upward pressure on wages. At the same time, the supply of low-skilled workers in the import-competing sector goes down, reducing the downward pressure on wages in that sector. In contrast, high-skilled

workers are stuck in the sector where they have acquired their skills. Consequently, the supply of high-skilled workers cannot adjust so quickly and wage differentials for high-skilled workers are much more persistent.
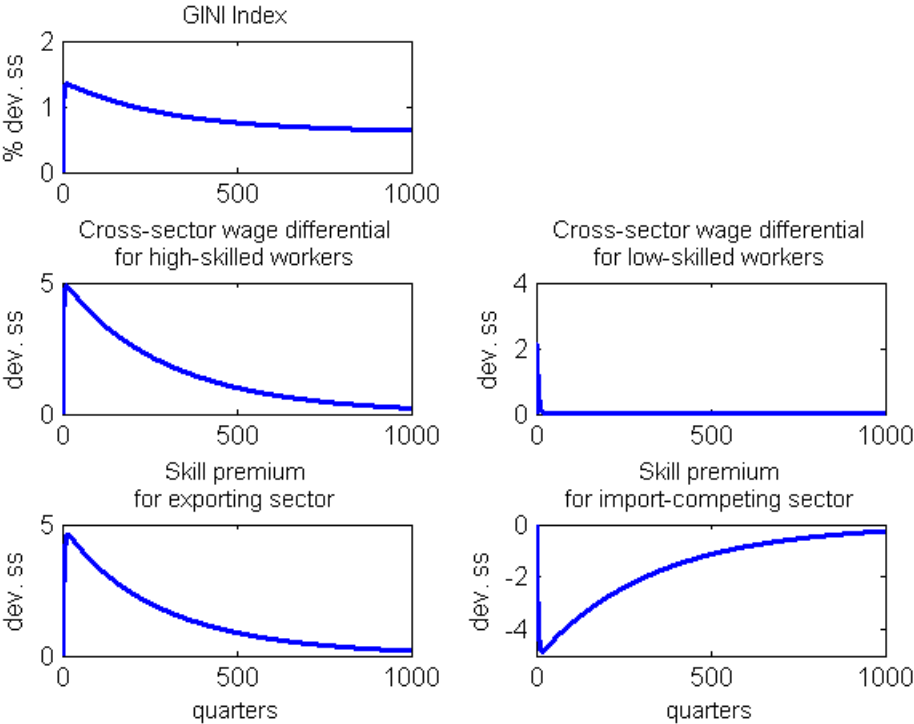
Furthermore, the faster (between-sector) migration of low-skilled workers relative to high-skilled workers implies a stronger shift in their respective shares in the production process. This benefits high-skilled workers in the exporting sector: As high-skilled and low-skilled workers are complements, the increase in the number of low-skilled workers increases the productivity of high-skilled labour. But it further hurts the high-skilled workers in the import-competing sector because the decrease in the number of low-skilled workers there reduces the productivity of high-skilled labour. Thus, high-skilled workers in the import-competing sector are hit twice by trade liberalization. First, the demand for their skills decreases. Second, their productivity goes down because so many low-skilled workers leave the sector. However, these are only transitory effects. High-skilled workers are slow to migrate but in the end many of them will also move to the exporting sector, partly because they retire and get replaced by young workers who are more flexible. Therefore, in the very long run the sector wage differential vanishes even for high-skilled workers.

The asymmetric speed of adjustment has also important implications for the skill premium, which, in the short run, goes in opposite directions in the two sectors. In the exporting sector, the skill premium goes up, as the ratio of high-skilled workers to low-skilled workers falls fast, which makes them more productive. In contrast, the skill premium in the import-competing sector goes down, as the ratio of high-skilled workers to low-skilled workers in that sector rises fast.

Figure 7 shows that the results change dramatically when we allow for training. The increase in overall wage inequality on impact is similar in both scenarios but the following development is the exact opposite. While the Gini index increased during the whole transition in Figure 5, it decreases in Figure 7. In the long run trade liberalization still increases wage inequality but to a much lesser extent. Compared to the pre-liberalization steady state, the Gini index increases by 1.3 percent 10 years into the transition and by as little as 0.6 percent in the post-liberalization steady state. This implies that ignoring training possibilities leads to an overestimation of the impact of trade liberalization on wage inequality. Furthermore, the implied dynamics suggest that after inequality peaks in the short run, we should expect a steady decline in future inequality.

The results suggest that this mainly stems from the fact that the dynamics of the skill premium is different from the no-training scenario. Now that low-skilled workers can train, the increased demand in the exporting sector induces some low-skilled workers in the exporting sector to invest in their skills, speeding up the increase in the number of high-skilled workers in the exporting sector. The possibility to train and become high-skilled in the exporting sector also enhances incentives for low-skilled workers in the import-competing sector to switch to the exporting sector. This reduces the productivity of high-skilled workers in the import-competing sector by even more than in the previous scenario. As a result, the skill premium decreases strongly and very persistently in the import-competing sector. This implies that some of the high-skilled workers in the import-competing sector would not have invested in skills before trade liberalization, had they anticipated the development of wages. In the exporting sector the skill premium still jumps up on impact but then begins to drop as the number of high-skilled workers quickly increases.

Figure 7: The Effects of Full Liberalization on Wage Inequality, Training Scenario

Also note that in the long run the skill premium goes back to its pre-liberalization level in both sectors. So in contrast to the earlier scenario, in the long run the higher demand for skills due to trade liberalization results not in a higher skill premium but in a higher number of high-skilled workers. Ignoring training possibilities leads to exaggerated estimates of the skill

premium effect of trade liberalization. Therefore, policies that foster training cannot only improve a country's stock of human capital, and therefore its comparative advantage, but have also the potential to counter rising skill premia.

Our results show that labour mobility is crucial for the distribution of income across workers. In a scenario where high-skilled workers are relatively less mobile than low-skilled ones, high-skilled workers are at the same time the biggest losers and the biggest winners from trade liberalization. While high-skilled workers in the import-competing sector lose, high-skilled workers in the exporting sector gain from trade liberalization. This is a striking result considering the fact that popular concerns about the negative effect on wage inequality from trade liberalization is usually associated with the low-skilled workers in the import-competing sector.

These results also have important policy implications. Labour market policies of increasingly globalized developed countries should concentrate on providing retraining to high-skilled workers so that they can switch their sector of employment more easily. In addition, low-skilled workers value the option to train and become high-skilled in the exporting sector very highly. In fact, having this option to train is behind the result that they are not the main losers from trade liberalization. Our findings suggest that a training subsidy can make this option to train even more valuable and mitigate their losses from trade liberalization. The option to train can even lead to a fall in the skill premium in the medium run and thus reduce overall wage inequality.[8]
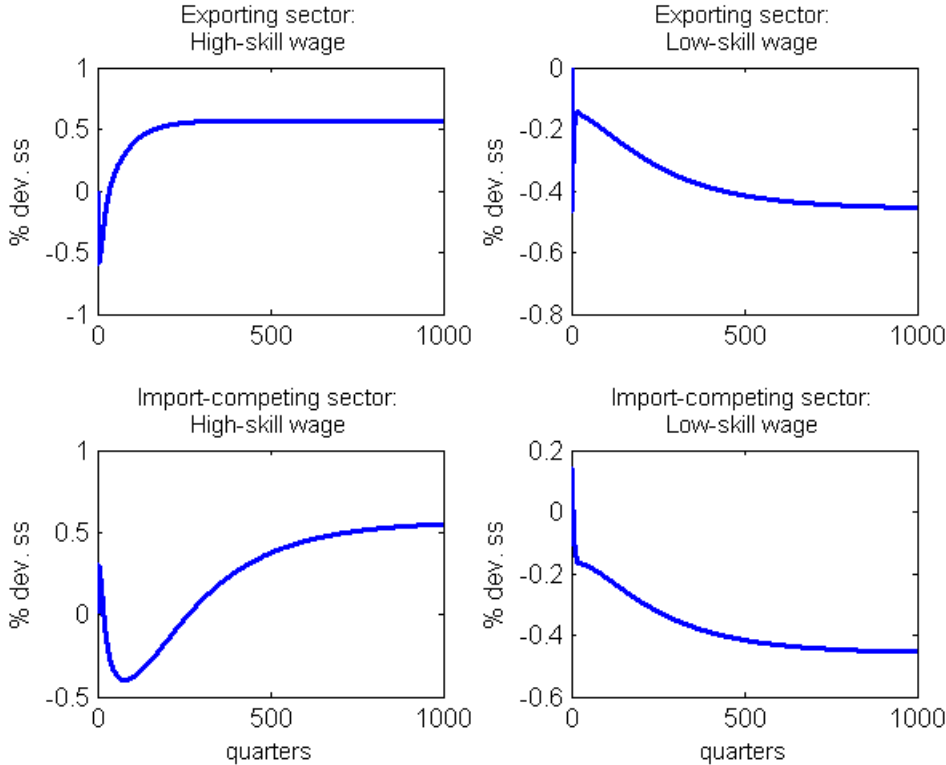
Full and partial liberalization

So far, we have discussed a full liberalization scenario, in which trade partners reduce trade barriers of both sectors simultaneously. In reality, however, countries often engage in partial trade liberalization where they reduce trade barriers only in specific sectors. Partial trade

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[8] There are only a few papers that analyse policies to compensate the losers of globalization. One important exception is Davidson and Matusz (2006b) who compare a variety of labour market policies designed to compensate workers that are harmed by trade liberalization. Their model considers a two-sector economy with perfectly competitive product markets and heterogeneous workers that differ in terms of their ability. Low-ability workers work in the low-tech sector that requires few skills and pays low wages. High-ability workers, in contrast, acquire high-tech skills and work in the high-tech, high-wage sector. Labour supply in the model is fixed but workers choose a sector, and acquire the necessary training, based on expected income. In the initial equilibrium, the low-tech sector is protected by a tariff. The removal of the tariff increases the real wage in the high-tech sector but reduces the real wage in the low-tech sector. Davidson and Matusz (2006b) identify two groups of losers from liberalization: "Stayers" that are stuck in the low-tech sector and "movers" that go through costly training to switch from the low- to the high-tech sector. In the context of their model, the former group of losers (the stayers) is optimally compensated by a (targeted) wage subsidy, while the latter group of losers (the movers) is optimally compensated by a (targeted) employment subsidy.

liberalization might be more appealing than full trade liberalization for two reasons. On the one hand, it is easier to negotiate partial trade agreements with other countries. On the other hand, partial liberalization might meet lower opposition at home based on the belief that adverse labour market effects would be smaller because vulnerable sectors are spared. The hope is that income of workers in the import-competing sectors will be protected and the rise in inequality mitigated. To address this question we simulate a partial liberalization scenario where we assume that the rich country is more powerful, and thus is able to push through its preferred agenda, namely reducing trade barriers in the sector where it has its comparative advantage and leaving the other sector untouched. With this strategy the rich country might hope to gain from increased exports in its comparative advantage sector, while at the same time avoiding stronger competition in the import-competing sector. We show that this reasoning is flawed.

Figure 8: The Effects of Partial Trade Liberalization on Sector- and Skill-Specific Wages, No Training Scenario
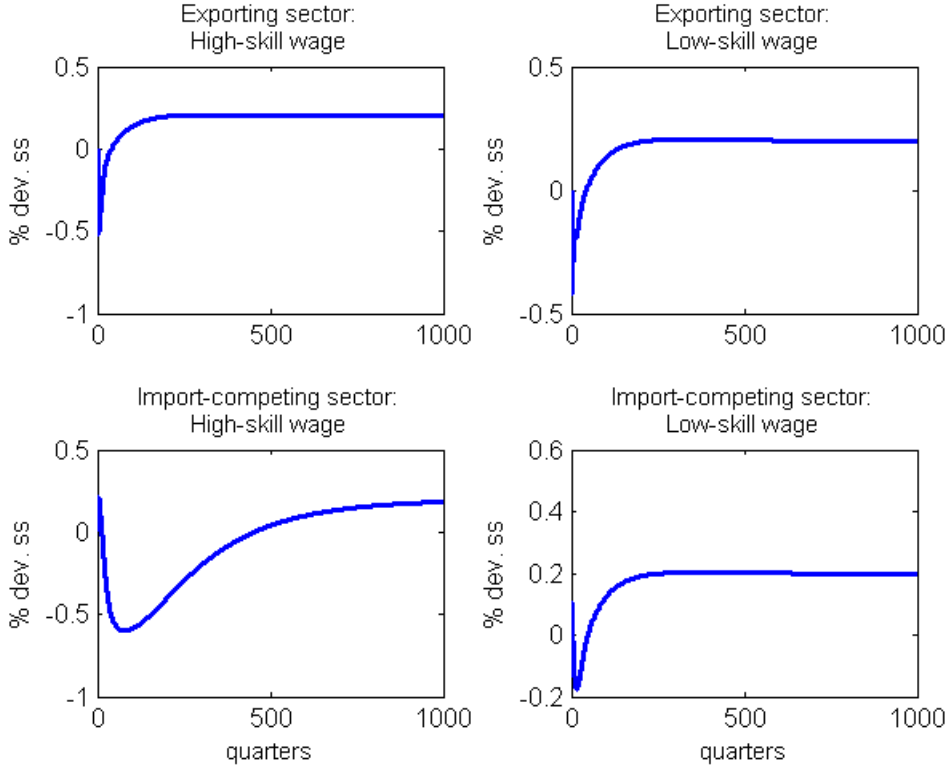

We first concentrate on the results in the scenario without training. They are illustrated in Figure 8. Both high and low-skilled workers have relatively lower incomes than in the case of full liberalization.

It is immediately evident that the low-skilled workers are especially hart-hit. The fall in the wages of low-skilled workers in the exporting sector is immediate and persists into the long-run. Although the wages of low-skilled workers in the import-competing sector increase a bit on impact, they soon decrease and stay below their initial pre-liberalization level.

High-skilled workers are also worse off under partial liberalization than under full liberalization. The wages of high-skilled workers in the exporting sector drop on impact but increase smoothly afterwards. The wages of high-skilled workers in the import-competing sector fall below the old steady state value for some time but must rise eventually to catch up with the high-skilled wage in the exporting sector. However, the wage gains for high-skilled workers are much smaller than in the scenario were both sectors were liberalized. Thus, it seems that leaving the import-competing sector untouched really takes away a large part of the income gains that high-skilled workers get from trade liberalization.

Leaving out the import-competing sector from trade liberalization does not protect the wage of workers in that sector. The import-competing sector suffers from a loss of competitiveness: The share of exporting firms declines and the sector does not gain from the reduction in trade costs. This loss in competitiveness hurts mostly the low-skilled workers who are relatively more important in the import-competing sector. Consequently, the distribution of gains and losses of globalisation differs between the full- and partial liberalization scenarios. When both sectors are liberalized, the biggest losers are the high-skilled workers in the import-competing sector. With partial liberalization, the low-skilled workers are the biggest losers.

Figure 9: The Effects of Partial Trade Liberalization on Sector- and Skill-Specific Wages, Training Scenario

However, this changes when we introduce training and allow the low-skilled workers to invest in their human capital. With training, partial liberalization has qualitatively similar effects on wages than full liberalization (see Figure 9). Trade liberalization increases the demand for high-skilled workers. This induces more low-skilled workers to pay the training cost to become high-skilled workers. Relative to the partial liberalization scenario without training, the supply of low-skilled workers is thus lower, while the supply of high-skilled workers is higher. Consequently, the wages of low-skilled workers are pushed up (relative to the partial liberalization scenario without training), while the wages of high-skilled workers are pushed down. This implies that high-skilled workers in the import-competing sector have to endure a prolonged period, in which their wages fall below the pre-liberalization steady state. In contrast, the increase in the low-skilled wage is large enough to turn the wage losses from the previous scenario into wage gains. The biggest losers from liberalization are then once more the high-skilled workers in the import-competing sector because their limited mobility leaves them stranded in the low-wage sector. It is important to emphasize that even in the training scenario; wage increases are much higher when both sectors are liberalized. Therefore, we continue to find that partial liberalization is less beneficial for workers than full liberalization.

It can be concluded that the idea that partial trade liberalization would protect the incomes of workers in the import-competing sector is flawed.[9] The wage gains from trade are considerably reduced when trade is only liberalized in the skill-intensive sector. The reduction in trade in the import-competing sector, which is associated with reducing trade barriers only in the exporting sector, might even considerably hurt low-skilled workers as well as high-skilled workers who have invested their skills in the 'wrong' sector.

5. Conclusion

Since at least the mid-1980s, and thus during a time of rapid globalisation, income inequality has markedly increased in many OECD countries. It is therefore not surprising that fears of increasing inequality play a dominant role in current debates on how globalization is affecting our economies. While trade economists have a long-standing interest in the distributional effects of freer trade, they mostly focus on long-run relationships and abstract from short-run adjustment processes. This policy paper has summarized new insights on the dynamic effect of trade liberalization on wage inequality.

In the context of a dynamic trade model with costly labour mobility (Lechthaler and Mileva, 2013), we have demonstrated that the effect of trade liberalization on wage inequality depends on i) the time horizon considered, ii) the degree of worker mobility, and iii) the degree of trade liberalization (partial/full). In a scenario without training, trade liberalization indeed increases wage inequality both in the short run and in the long run. In the short run, wage inequality is mainly driven by inter-sectoral wage inequality, while in the long run wage inequality is driven by an increase in the skill premium.When worker training is considered, the effects can differ a lot. Then trade liberalization will lead to an increase in the number of high-skilled workers, while wage inequality increases only little. We also show that wage gains from freer trade are considerably reduced when trade is only liberalized in the skill-intensive sector. The popular belief that partial trade liberalization would protect the wages of workers in the import-competing sector is flawed.

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[9] If both countries restrict their trade liberalization to their respective comparative advantage sectors, the effects are even more striking (see Mileva and Lechthaler, 2013, for the details). Not only are the gains from increased trade reduced but the most vulnerable workers are hurt even more than under symmetric trade liberalization. The reduction in trade in the import-competing sector that comes with a liberalization of the exporting sector hurts high-skilled workers who have invested their skills in the 'wrong' sector.

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Project Information

Welfare, Wealth and Work for Europe

A European research consortium is working on the analytical foundations for a socio-ecological transition

Abstract

Europe needs change. The financial crisis has exposed long-neglected deficiencies in the present growth path, most visibly in the areas of unemployment and public debt. At the same time, Europe has to cope with new challenges, ranging from globalisation and demographic shifts to new technologies and ecological challenges. Under the title of Welfare, Wealth and Work for Europe – WWWforEurope – a European research consortium is laying the analytical foundation for a new development strategy that will enable a socio-ecological transition to higher levels of employment, social inclusion, gender equity and environmental sustainability. The four-year research project within the 7th Framework Programme funded by the European Commission was launched in April 2012. The consortium brings together researchers from 33 scientific institutions in 12 European countries and is coordinated by the Austrian Institute of Economic Research (WIFO). The project coordinator is Karl Aiginger, director of WIFO.

For details on WWWforEurope see: www.foreurope.eu

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