



Tax reforms under market distortions in product and labour markets



Konstantinos Angelopoulos^{a,*}, Wei Jiang^b, James R. Malley^a

^a University of Glasgow, Adam Smith Business School (Economics), Glasgow G12 8QQ, United Kingdom

^b School of Economics, Keynes College, University of Kent, Canterbury, Kent, CT2 7NP

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ABSTRACT

Using a two-agent model comprised of capitalists and workers, this paper examines the importance of imperfect competition in product and labour markets in determining the welfare effects of tax reform. The reform considered consists of eliminating the capital tax alongside a concurrent rise in the labour tax. In contrast to the perfectly competitive model, models with product or labour market failures each result in welfare losses for the workers in the long-run. In a realistic calibration to the UK economy, combining these imperfections implies that this tax reform will be Pareto improving in the long-run. However, these welfare gains over longer time horizons come at the cost of short-run losses, which, consistent with previous research, result in welfare losses for workers post-reform.

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1. Introduction

The influential research of Lucas (1990) established that a tax reform which reduced the tax on capital, while concurrently increasing the tax burden on labour, could increase aggregate welfare in the long-run. Moreover, the analysis of optimal taxation that builds on the contributions of Judd (1985) and Chamley (1986) showed that in the neoclassical model it is optimal to eliminate the capital tax in the long-run, even for those agents that do not hold capital (see e.g. Atkeson et al., 1999; Ljungqvist and Sargent, 2012, Chapter 16). These findings suggest that such tax reforms can produce welfare gains for both capitalists and workers, if the labour productivity gains following the capital tax cut outweigh the increased labour tax contributions.

Despite potential gains in the steady-state, other research shows that there can be negative welfare effects from tax reforms that redistribute the tax burden from capital to labour (see e.g. Garcia-Milà et al., 2010). This is because the benefits to workers, through the channel of increased labour productivity, are higher in the long-run, whereas the costs, in the form of higher labour taxes, have an immediate and quantitatively large effect. The literature has also shown that market imperfections are crucial in determining the aggregate and redistributive effects of such tax reforms. For example, Domeij and Heathcote (2004) analyse the importance of uninsured idiosyncratic productivity shocks and Ardagna (2007) studies the importance of unionised labour markets (see Garcia-Milà et al., 2010 for a review of this literature).¹

* Corresponding author. Tel.: +44 141 3305273.

E-mail address: Konstantinos.Angelopoulos@glasgow.ac.uk (K. Angelopoulos).

¹ A significant body of literature has examined the conditions under which an optimal non-zero capital tax can be obtained in the long-run. For example, within a representative agent model, Guo and Lansing (1999) and Domeij (2005) introduce product and labour market power respectively, while Klein et al. (2008) highlight the importance of commitment in policy making. Moreover, in models with heterogeneous agents, a non-zero optimal capital

With a view to contributing to the tax policy literature focussed on the welfare and distributional effects of re-allocating the tax burden from capital to labour income, we study the importance of unionised labour markets and monopolistically competitive product markets in both the short- and long-run. To quantitatively illustrate our results, we use a calibrated model of the UK economy.² In our setup the government taxes capital income, including interest on savings and profits, and labour income by using two different tax rates. In the unionised labour market, the wage rate is determined, following e.g. Nickell and Andrews (1983), Farber (1986), Pissarides (1998), Kaas and von Thadden (2004), as the outcome of a Nash-bargain between unions and firms. The tax revenue is used to finance unemployment benefits and non-employment related public transfers. In the monopolistically competitive product market, following e.g. Dixit and Stiglitz (1977), Benhabib and Farmer (1994) and Guo and Lansing (1999), intermediate goods producers earn non-zero economic profits.

To highlight the importance of union bargaining in the labour market and firm power in the product market relative to the competitive model, we stay as close as possible to the standard open-economy neoclassical model. The agents are distinguished in this setup by differences in their capital holdings, which can be motivated by imperfections in the asset markets that require agents to pay different participation premia (see e.g. Aghion and Howitt, 2009). On the other hand, households are identical in the labour market since unions guarantee that their members have equal employment and wages (see e.g. Pissarides, 1998). Following, for example, Judd (1985), Lansing (1999), Krusell (2002) and Blanchard and Giavazzi (2003) we allow for two types of households (i.e. capitalists and workers) and assume that workers do not participate in the asset market. The capitalists, on the other hand, own the firms and invest in capital in the local economy and in foreign assets.

Our over-arching finding is that the presence of labour and product market distortions is crucial in determining the welfare effects after a capital tax cut and a concurrent labour tax rise. In particular, our results show that although tax reforms imply welfare losses for the workers under distortions in either market, it is only when both imperfections in labour and product markets characterise the economy that the reform can be Pareto improving in the long-run.

Previous research suggests that, on their own, each of these market imperfections implies that tax reforms which eliminate the capital tax and increase the labour tax can lead to welfare losses for at least a segment of the population, in the long-run.³ While these implications are confirmed in our model, we also find that when both failures characterise the economy, one distortion contributes to correcting the negative welfare effects of the other for the workers. In other words, a capital tax cut can be Pareto improving in the long-run, despite increasing inequality. In particular, monopolistic profits create incentives in wage bargaining such that the effect of the capital tax cut on the marginal product of labour and on labour demand tends to increase employment. Additionally, the presence of unions guarantees that the net wage remains unchanged in the long-run after the increase in the labour tax. Thus, the new price-quantity equilibrium in the labour market implies an increase in employment at the same net wage and is thus favourable to the workers.

Our modeling allows us to analyse the labour productivity–tax burden trade-off, following the tax reform, under various assumptions regarding the competitiveness of labour and product markets. In a version of the model with perfectly competitive product and labour markets, the worker gains in the long-run by a tax reform that decreases the capital tax and increases the labour tax. This is because the productivity gains associated with the increased capital stock in the long-run outweigh the costs of higher labour taxation. If firm power in the product market is introduced, then workers lose from the tax reform through lower net wages. This is since the elimination of the capital tax implies foregone income from profit taxation, so that the labour tax needs to be increased by more and dominates the positive effects of increased labour demand.

When workers are allowed to form unions, they can bargain over the wage rate with the monopolistic firms and this results in the same post-reform long-run net wage despite the rise in labour taxes. However, in the absence of monopolistic profits, such wage bargaining leads to increases in unemployment, to discipline the wage demands of the unions (see also e.g. Pissarides, 1998). As a result, labour income is reduced. On the other hand, monopolistic profits create incentives in the Nash-bargain for higher employment and wages following the increase in labour productivity since the relative attractiveness of a successful bargain is higher in this case. As a result, the increase in labour productivity post-reform implies an increase in labour demand that can increase both the price and quantity of labour.

Consistent with the literature, all models considered imply welfare losses for the worker during the transition to the new steady-state. However, we find that the presence of unions helps to control the size of these losses, compared with a model characterised by monopolistic firms and competitive labour markets. This is because wage bargaining accounts for the increase in the labour tax and thus the net wage does not drop by so much in the short-run post-reform.

The rest of the paper is organised as follows. Section 2 sets out the model structure and Section 3 discusses the calibration of the model to the UK economy. Section 4 explains the implementation and solution of the tax reform. The results are analysed in Section 5 and Section 6 concludes.

(footnote continued)

tax can be obtained, for instance, under uninsured idiosyncratic risk (see e.g. Aiyagari, 1995), skill differences (see e.g. Conesa et al., 2009) or lack of commitment mechanisms on the part of the government (see e.g. Krusell, 2002; Angelopoulos et al., 2011).

² Tax reforms have recently received a great deal of attention for policymaking (see e.g. the discussion in Garcia-Milà et al., 2010 for OECD countries and Mirrlees et al., 2010, 2011 for the UK).

³ For instance, Ardagna (2007) employs a model with monopoly union power and documents negative welfare effects for workers after increases in labour taxes for all time horizons, while Guo and Lansing (1999) show that the optimal capital tax in a model with monopolistic competition in the product market can be non-zero.

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