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German Institute
for Economic Research

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Microsimulation Analysis for Germany**

Berlin, August 2007

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**How Should Local Governments Tax Local Business?
Lessons from an International Comparison and a
Microsimulation Analysis for Germany¹**

Berlin, August 23rd, 2007

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Abstract

The local business tax as the main revenue source of local governments in Germany has been under extensive debate for decades. Proposals for reform range from a broad tax base in the sense of an origin-based value-added tax to a pure profit tax that could be implemented as a surcharge on corporation and personal income tax. Local business taxation systems in OECD countries actually represent the whole spectrum between these two extremes. We use a newly developed microsimulation model for the business sector in Germany to analyse the fiscal and distributional effects of the general reform options identified, including the extension of the local business tax to liberal professionals. We also analyse the effects of the actual German business tax reform 2008 with respect to local business tax revenues.

JEL classification: H71, H25, C8

Keywords: Local business tax, microsimulation, local taxation, tax reform

1 Introduction

Local business taxation has been a constant source of discomfort and critique among policy makers, taxpayers and academics for a long time not only in Germany but apparently in many countries. Economists have pointed out that local business taxes are often rather a product of piecemeal legislation enacted over decades and do not follow clear guidelines of local taxation such as fiscal equivalence and the benefits principle (see e.g. Studenski (1940) and Testa and Oakland (1996) referring to the USA or Maiterth and Zwick (2006) referring to Germany). In Germany, the local business tax is the main source of revenues for local governments and imposes a considerable burden on enterprises. As the tax largely depends on business profits, municipalities are faced with highly volatile tax revenues. Politicians, interest groups and economists have proposed various options for reform ranging from a pure profit tax to an origin-based value-added tax. The literature weighting the arguments is extensive.²

In spite of the dimension and importance of the debate, empirical information on the fiscal and distributional impact of different local business taxation systems based on micro data is scarce. Case studies and showcase calculations have dominated simulation studies of business taxation (e.g. Devereux *et al.* 2002, Spengel 2003). One reason is that detailed and representative individual firm and tax file data was hardly available, especially about small and medium sized enterprises (SME).³ In Germany, fortunately the Research Data Centre of the statistical offices has made tax statistics increasingly accessible recently. Another reason for the scarce empirical literature is that the behaviour of firms is hard to model as it has many dimensions – financing, investment, hiring, incorporation, entry and exit decisions all interact. This may explain why the field of microsimulation first covered the household sector, where the main economic decisions, labour force participation and work intensity, are more easily modelled, and is only slowly expanding into the business sector as researchers are gaining more experience with microsimulation and computational power is growing at the same time. Maiterth and Zwick (2006) used a microsimulation model to assess the impact of two reform options for the German local business tax on 253 example municipalities which were selected from

² Examples for the German discussion are Döring and Feld (2005), Petersen *et al.* (2005), Vesper (2004), Fuest and Huber (2003), Maiterth (2003), Junkernheinrich (2003), Zwick *et al.* (2003), Jarass and Obermaier (2003), Bach and Versper (2002), Scherf (2002), and Zimmermann (2002).

³ Data on large corporations has been used for research more often as they are obliged to publish financial statements.

the total of almost 14,000 municipalities in Germany. While this analysis reveals interesting trends, it is not representative.

In this paper, we describe our newly developed microsimulation model BizTax which is based on a representative sample of official individual local business tax and income tax files for 2001.⁴ For the first time in Germany, the fiscal and distributional effects of reform options for the local business tax can be quantified in detail on the basis of micro data.

In the section following this introduction, we describe the institutional background in Germany and summarise the discussion around the local business tax. Based on an international comparison of local business taxes in OECD countries, we identify basic models of local business taxation. These models are discussed in the light of public finance theory. This leads to the definition of five fundamental tax reform options for the German local business tax. In the third section, we describe the data and the microsimulation model BizTax that we use to quantify the effects of these reform options. Section 4 presents the simulation results. The microsimulation model allows a precise analysis of the fiscal and distributional effects of the reform scenarios by industry, legal form, and by firm size in terms of profit and number of employees. Additionally we are able to analyse the impact of the reform on different regional categories. For each of the various reform options, we investigate how its implementation would redistribute local business tax revenues between cores of agglomeration, surrounding areas and rural areas, between western and eastern Germany, and between municipalities with high, medium and low local tax revenues per capita. The last section provides a short summary and conclusion.

2 Local Business Taxation in International Comparison

2.1 German local business tax (“Gewerbesteuer”) under discussion

The German local business tax (“Gewerbesteuer”) has been under extensive debate for decades. Having its origins in the 19th century “taxe professionnelle”-tradition, it has been assigned to the local layer of German fiscal federalism since the 1930s. To this day, the local business tax is the main tax source of local governments in Germany (OECD 2006). Originally, it rested on the pillars “profit before interests” (with adjustments), “capital” and “pay-

⁴ The data is available at the Research Data Centre of the statistical offices, <http://www.forschungsdatenzentrum.de>.

roll". The idea was to tax a broader base of local value-added. However, over the last decades several reforms washed out the tax base increasingly. The optional payroll component was discarded in 1980, the addition of interest expenses on long-term debt to the taxable income was reduced by half in 1984, and the business capital tax was abolished in 1998. Since its early days, the tax has exempted liberal professions such as physicians, lawyers, architects, and journalists, as well as farmers.

Today, the main source of the local business tax base is the operating profit attributed to the local jurisdiction. Therefore, received dividends are not subject to tax, and, correspondingly, losses from shareholdings are not allowed to be set off against taxable income. Moreover, the tax base is augmented by half of the interest expenses on long-term debt. Based on the resulting taxable income, the local business tax is determined in two steps. In the first step, the taxable income is multiplied by a basic federal tax rate ("Messzahl") of 5 % (in 2007) in order to obtain the uniform basic tax. Unincorporated firms, in particular SMEs, benefit from an allowance of €24,500 and reduced basic federal tax rates up to a taxable income of €72,500. The uniform basic tax is allocated to the local jurisdictions involved. In the second step, the local jurisdictions apply a multiplier, which they are entitled to determine, to their allocated share of the uniform basic tax. These multipliers range from a minimum rate of 200 % to about 500 % in high-performing agglomerations such as Munich or Frankfurt. Taking into account that the local business tax liability reduces its own tax base as deductible expense, the effective local tax rates range from the minimum rate of 9 % to almost 20 % in 2007. The average rate is about 16 %. Sole proprietors and partners of non-incorporated firms can credit parts of the local business tax against their personal income tax in a lump sum.

Thus, the local business tax imposes a rather high tax burden in particular on incorporated companies that do not benefit from the allowance, the reduced tax rates on low income and the income tax credit. Corporations account for almost 60 % of the tax revenue, which is highly concentrated on big and highly profitable enterprises. The local business tax rates considerably contribute to the high statutory tax rates on business profits in Germany, which are among the highest in Europe. Consequently, the main intention of the federal government's recent business tax reform, which will come into effect on January 1st 2008, is to significantly reduce this high tax rate and broaden the tax base.

Besides the critique against high tax rates from the perspective of national economic policy there is a long-lasting discontent with respect to the requirements of local public finance.

Local politicians and administration prefer revenue-stable taxes in order to provide public services continuously. As the local business tax is predominantly levied on business profits, the local tax revenue strongly depends on the business cycle. Borrowing limits are stricter for local authorities than at the state or federal level, which makes it difficult for them to borrow during recessions and smooth expenses over the business cycle. Therefore, local politicians often cut investment and other discretionary outlays in recessions and are tempted to spend generously during boom periods, partly because they may hope for a bail-out in a possible subsequent financial crisis. The combination of volatile local tax revenues and these politico-economic circumstances often leads to a pro-cyclical fiscal policy.

Moreover, as most SMEs are exempted due to the allowance or pay only little tax due to the progressive tax schedule for non-incorporated firms, the tax revenue in a single municipality often depends on the economic performance of a small number of large enterprises and may be hit hard by the downturn of an industry dominating the regional economy. This leads to a pathological fiscal impairment in old industrial regions fighting with structural change, in particular in eastern Germany. Fiscal equalisation schemes of the federal states have to adjust for this via grants. Thus, the current tax scheme conflicts with central elements of local fiscal autonomy and fiscal federalism.

German local governments stick to the local business tax nonetheless. It is the main local revenue source that provides a considerable degree of fiscal autonomy. The land tax is also under the discretion of local governments, but due to an outdated assessment of real estate the tax base is weak and local politicians refrain from raising tax rates for landlords and dwellers. The local governments receive a share of income tax revenue, but are not entitled to set the tax rate. Local governments and their lobbyists suggest to “revitalise” the local business tax with respect to the tradition of taxing a broader base of local value added. In particular, they propose to fully add to taxable income all kinds of interest expenses and other financing costs such as leasing rates or royalties (Maiterth and Zwick 2006). This prompts strong resistance from the business community and their organisations which fear a higher tax burden on cost elements. They try to use the opportunity to dismiss the, as they see it, outdated local business taxation system and suggest to replace it by a local surcharge on the personal and corporate income tax liability. Both sides carry heavy political weight. A reform of local business taxation as the central part of a more general reform of the local public finance institutions failed in 2003, not bringing together these opposite positions (Junkernheinrich 2003).

The recently adopted German business tax reform 2008 only includes minor changes to the local business tax. The main goal of the reform is to lower the overall statutory tax rate on corporate profits to below 30 %. Besides the reduction of the corporation income tax to 15 %, the basic federal tax rate of the local business tax will be lowered from 5 % to 3.5 % and the reduced basic tax rates for enterprises with low profits will be abolished. At the same time, the deduction of the local business tax from its own tax base as well as from corporate and personal income tax will be eliminated.⁵ Moreover, the reform provides tighter provisions against tax planning schemes and repeals the declining-balance method of depreciation. The tax base of the local business tax is further affected by a modified addition of interest expenses: The addition of half the interest expenses on long-term debt is replaced by the addition of 25 % of all interest expenses including the estimated interest portion of rents, leasing rates and royalties in as much as they exceed an allowance of €100,000. Thus, the reform basically aims at the urgent needs to improve the competitive position of the German business location in international tax competition and to reduce the incentives for tax planning (Bach, Buslei and Dwenger 2007). A fundamental reform of local business taxation and of local public finance institutions remains at the top of the agenda.

2.2 Lessons from public finance theory and international comparison

What can economists contribute to cut the Gordian knot of reforming German local business taxation? In the following section, we briefly recall what public finance theory and practice might tell us about a reasonable tax assignment to municipalities. This is illustrated by an international comparison of local taxation systems, in particular on the business sector (Tables 1 and 2).

The basic idea behind fiscal federalism theories is “fiscal equivalence” (Olson 1969, Bird 1999): If there are public services that benefit certain regions or groups, the pertinent beneficiaries shall decide on their quantity and quality but at the same time pay for it. This prompts citizens and firms to reveal their preferences and put some pressure on local governments for the efficient provision of public services. Where specific beneficiaries of public services can

⁵ For sole proprietors and partners of non-incorporated firms this is compensated by a higher lump sum credit against the personal income tax.

be identified, user charges are the preferred option. However, they are often ruled out for technical reasons or due to transaction costs. In these cases, taxation has to carry out the job.

Local taxes are typically based on immobile components to ensure that the local beneficiaries bear the tax burden. All of the main OECD countries listed in Table 1 raise a land or property tax that is usually levied on the whole real estate value including residential buildings as well as plants and other commercial buildings. Moreover, the international comparison shows that in several countries local governments are endowed with some discretion to tax business properties as well as the resident population's income. In particular the German tradition in local public finance theory and practice highlights local firms and residents as the two main consumer groups of local public services (Zimmermann 2002). Correspondingly, both groups may contribute to the local budget via specific taxes in order to balance the different claims for public services. However, it is difficult to apportion the share between both groups properly since the main public services of the municipally benefit both groups, e.g. transportation infrastructure or secondary education. Thus, the idea of sharing the local tax burden between firms and residents can only serve as an institutional yardstick for political decision making.

Table 1 Tax Base and Revenue of Local Business Taxes¹⁾ in Selected OECD Countries

Country	Tax Base							Revenue 2004 ²⁾		For information:	
	Business value added			Business capital		Local corpor. income tax	Other production factors	as percentage of		Land / property tax	Local income tax
	Profit	Interest expenses	Wage expenses	Fixed assets	Equity / net capital			GDP	Local tax revenue		
Germany	✓	✓						1.3	50.0	✓	
France				✓				1.3	26.4	✓	✓
Belgium							✓			✓	✓
Netherlands										✓	
Austria			✓					0.8	20.7	✓	
Denmark										✓	
Finland										✓	✓
Sweden										✓	✓
Luxembourg	✓							1.7	91.3	✓	
United Kingdom										✓	
Ireland										✓	
Italy	✓	✓	✓					2.3	33.4	✓	
Spain							✓	0.2	1.6	✓	
Portugal							✓	0.2	12.4	✓	
Greece										✓	
Poland										✓	
Czech Republic										✓	
Slovak Republic										✓	
Hungary	✓	✓	✓					1.5	65.0	✓	
Norway										✓	
Switzerland							✓	0.5	10.9	✓	✓
Turkey										✓	
United States	✓	✓	✓	✓	✓	✓	✓	0.0	1.0	✓	✓
Canada										✓	
Japan	✓						✓	0.0	21.5	✓	✓
Australia										✓	
New Zealand										✓	

1) Business taxes with considerable discretion over the tax revenue assigned to the local government, in particular the right to set the tax rates at least in certain limits.- 2) Excluding property tax revenue from plants and other business assets.
Sources: Mennel and Foerster (2006), OECD (2006), European Commission (2007), IBFD (2007).

Table 2 Local and Regional Business Taxes¹⁾ in Selected OECD Countries

Country	Designation	Taxpayer	Tax Base	Tax Rate
Germany	Gewerbesteuer (local business tax)	Business enterprises, excluding farmers, professionals	Local operating profit plus half the interest expenses on long-term debt. Allowance of Euro 24,500 for non-incorporated firms	9% - 20%, average: 16.3% lower rates for small firms
France	Taxe professionnelle (local business tax)	Business enterprises and professionals, excluding farmers	Local fixed assets rental value, reduced by 16%	Limited to 3.5% of gross value added
Austria	Kommunalsteuer (municipality tax)	Entrepreneurs or other employers subject to VAT	Wage expenses, low threshold for small firms	3%
Luxembourg	Impôt commercial (local business tax)	Business enterprises, excluding farmers, professionals	Local operating profit. Allowance of Euro 40,000 for non-incorporated firms and Euro 17,500 for incorporated firms	6% - 9%
Italy	Imposta regionale sulle attività produttive - IRAP (regional business tax)	Entrepreneurs, non-profit organizations and public bodies	Local net value added from the provision of goods and services (subtraction method), wage expenses for non-profit organizations	Standard rate 4.25%, region's discretion of +/- 1%-point
Portugal	Surcharge on corporation income tax (CIT)	Corporations subject to CIT	Local share of CIT liability	0% - 10%
Hungary	Helyi iparüzési adó (local business tax)	Entrepreneurs	Local gross value added (subtraction method). Allowance of Euro 10,500 (optional)	0% - 2%
Switzerland				
Canton de Genève	Taxe professionnelle (local business tax)	Business enterprises and professionals, excluding farmers	Local business sales, rental fee of fixed assets, number of employees	
Other cantons	Surcharge on national corporation income tax (CIT)	Corporations subject to national CIT	Local share of CIT liability	
Spain	Impuesto sobre actividades económicas (local business tax)	Business enterprises and professionals, excluding farmers	Industry sector and floor space used, number of employees, electricity consumption. Exemption up to a turnover of Euro 1,000,000	
United States	Various types: surcharge on national CIT and PIT, franchise (income) tax, property tax on business fixed assets	Enterprises subject to PIT or CIT	Local share of business income or CIT liability, partly wage expenses, fixed assets, or equity capital	usually 1% - 2% (local CIT surcharge)
Canada (provinces)	Capital tax	Incorporated enterprises	Equity capital	0.3% - 0.5%
Japan	Enterprise Tax	Business enterprises and professionals, excluding farmers	Local operating profit	3% - 12%

1) Business taxes with considerable discretion over the tax revenue assigned to the local government, in particular the right to set the tax rates at least in certain limits.
Sources: Mennel and Foerster (2006), OECD (2006), European Commission (2007), IBFD (2007).

Beyond the land tax, the international comparison displays a wide range of local or regional business taxation systems. Nearly all conceivable combinations of the different production factors can be found as the tax base. From this variety of taxation systems some general models can be identified.

- A local *profit tax* exists in Luxembourg and Japan. Luxembourg raises a kind of “Gewerbesteuer” historically adopted from Germany which is, however, based on operating profits only. Japan levies a local enterprise tax on local business profits.
- In some countries there are local *rates* to the national *corporation income tax*. Examples are Portugal, Switzerland, and the USA. These local rates are levied on the profit share apportioned to the local jurisdiction, usually allocated by a formula using payroll, sales, capital, or a weighted index of these factors. In the USA, the state and local franchise taxation systems often extend or replace the corporation income tax base by elements of capital or payroll.
- Austria transformed its former “Gewerbesteuer” adopted from Germany to a local *payroll tax* during the nineties. The payroll is taxed at 3 % without any discretion of the local government over the tax rate.
- Taxes on business *capital* are in place in France, in the Canadian provinces, and in the USA. The historical “taxe professionnelle” has survived to this day in France as a local business tax on fixed assets, measured by the rental value. The former payroll component of the tax was phased out until 2003. The Canadian provinces levy taxes on the equity capital of incorporated firms. In the USA, the state and local franchise taxation systems often include a capital component. Moreover, many local property tax systems in the USA do not only tax real estate including commercial buildings but also fixed assets such as machinery, motor vehicles, or other equipment.
- A tax on local *value added* exists in Italy and Hungary. Both countries use the subtraction method to define the value added, i.e. sales revenues minus operating expenses on the purchases of goods and services. In contrast to the national VAT that is applied in nearly all OECD countries as a tax on final consumption, this value-added tax is origin based and thus does not provide an input tax credit, and exports to outside the jurisdiction are not exempted. The tax base of the Italian IRAP goes beyond the mere cash flow base of the national VAT by providing depreciation allowances for investments in fixed assets and accounting for capital gains and losses on operational assets. Hungary applies a gross cash flow base: neither expenditures for investment goods nor depreciation allowances can be set off against the tax base.

- Finally, there are local business taxes that are levied on various *business properties*, e.g. floor space used, number of employees, electricity or energy consumption. Spain has such a taxation system, similar forms of local business taxation exist in the Swiss canton of Geneva, Belgium, and other countries. These taxes and charges usually do not raise considerable revenues, however.

The revenue impact reported in Table 1, which we derived from the OECD revenue statistics (OECD 2006), only includes pure business taxes. It does not include revenues from land or property taxes falling on business properties as the statistics do not allow distinguishing between the shares of the business and the private spheres. Thus, the reported revenue shares underestimate the overall local tax burden on business properties. In many countries, local land or property taxes charge a much higher tax burden on real estate than in Germany. Particularly, in most states of the USA the local property taxes extend to a wider range of fixed assets (see above), so the tax revenue is considerably higher than the reported one which arises from the local franchise taxes.

2.3 Reform options for Germany

What does this discussion imply for a local business tax reform in Germany? First of all, the share of the local business tax in the overall tax burden appears rather high in international comparison, even if one takes into account that the share of property tax revenues that falls on enterprises may be considerably higher in many other countries. On the other hand, German local Governments normally provide a rather high standard in infrastructure and other public services. If politicians decide to carry out a more or less revenue-neutral tax reform, the question remains how to rebuild the tax base.

In any case, liberal professionals and farmers should be included in local taxation. The exemption of these sectors, which has survived since the 19th century, is contrary to the benefits received principle, as liberal professionals typically use public services in the same way as other self-employed especially in the service sector (Bach, Broer and Fossen 2007). Furthermore, it might be considered to include non-profit organisations or even state and federal public bodies, which also benefit from local public services, in the tax base. This is the case in Italy, for instance.

The first reform option is to transform the local business tax to a pure tax on business *profits* as in Luxembourg and Japan. This system meets the claims of the business community not to tax cost elements and to restrain from a higher tax burden on economic ability. They argue that the taxation of cost components such as interest and wage expenses can cause liquidity problems for companies during periods of low profits or losses and thus hamper the recovery of companies in trouble. Risky investments become less attractive as enterprises have to pay taxes even in case of failure. Another argument to tax local profits may derive from the theory of economic geography (e.g. Baldwin *et al.* 2003, Baldwin and Krugman 2002), which discusses the existence of location-specific rents. Such rents may, however, also appear as higher wages for managers and high-qualified specialists. Moreover, it is technically difficult to skim rents by taxes on extra profits or wages. In general, it is rather complicated to determine the local profit of a subsidiary or an establishment of a firm operating supraregionally or even internationally. In these cases the taxable income of the entire company or tax group is usually assessed at the national level and allocated to the sub-national jurisdictions by formula apportionment. As this formula uses payroll, sales, capital, or other business properties the apportionment transforms the local profit tax into a tax on these production factors (Gordon and Wilson 1986). A further disadvantage of a local profit tax is the high volatility of revenues. If it is argued that the government rather than the private sector should provide insurance against cyclical fluctuations in the tax base, this task should be fulfilled at the federal level rather than the local level, as experience shows that local governments often fail to smooth expenditures due to stricter borrowing limits and politico-economic reasons.

This speaks in favour of a broad-based business taxation at the local level, which has been the second wing of the German reform discussion for many years. The tax base could be extended to interest expenses and other financing costs as well as the payroll. Taxing all income components would lead to a tax on local net value added like in Italy. This would imply neutrality with respect to the input production factors. The other alternative is a tax on business property, obviously measured by real estate, plant, or equipment that could be easily assigned to the local jurisdiction. All these broad-based taxation systems would however imply a shift of the tax burden to the taxed production factors, in particular to those which are less mobile if the tax burden does not meet higher productivity at the location.

To sum up, we define five fundamental tax reform options for the German local business tax.

1. Integration of liberal professionals and farmers in the local business tax. They are also included in the following reform options 2-5.
2. Local business income tax: pure profit tax.⁶ Like in the actual business tax reform 2008, but in contrast to the other scenarios considered here, this tax is not deductible from its own tax base, because it is not considered a cost component.
3. Local comprehensive business income tax (CBIT): tax on profits and all interest expenses, rents, leasing rates and royalties.⁷
4. Local business value-added tax: additionally to the CBIT, the tax base includes the sum of wages and salaries.⁸
5. Local property tax: The tax base comprises 10 % of the fixed assets of an enterprise, which can be interpreted as a hypothetical rate of return on business capital.

We simulate the fiscal and distributional effects of each of these reform scenarios using our microsimulation model BizTax. The law of 2007 is the starting point for the definitions of the reform scenarios. Deviating from this, we assume that the reduced federal basic tax rates for enterprises with low profits are abolished, as in the actual business tax reform 2008. The allowance is left unchanged, except for the business value-added tax; here it is increased because of the substantially broader tax base. Specifically, it is set at a level that exempts the same share of firms with a positive tax base from the tax as if the actual law of 2007 was applied (almost a third). Finally, for each reform scenario we determine the federal basic tax rate which makes the reform neutral with respect to total local business tax revenue. Additionally, we also simulate the effects of the actual German business tax reform 2008, but without the changes regarding the determination of profits due to a lack of data (see section 4).

⁶ This reform option could also be implemented as a surcharge on corporation and personal income tax, as advocated by the Federation of German Industries (BDI) and the German Chemical Industry Association (VCI) (2001).

⁷ A similar reform ("Kommunalmodell") was proposed by the German local authority central organisations (Bundesvereinigung der kommunalen Spitzenverbände 2003).

⁸ Compare the discussion of an origin based value-added tax ("Wertschöpfungsteuer") by Bach and Vesper (2002).

3 Microsimulation Model for the Business Sector

Microsimulation models have developed to increasingly capable tools for the ex-ante analysis of fiscal and distributional effects of tax and social policy reforms. The prerequisite is a representative micro data basis of relevant agents such as individuals, households or firms. The models simulate the effect of a given policy reform for each individual agent and find the overall fiscal effect by aggregation, which can be split by group characteristics such as income classes or industries to analyse the distributional effects. While microsimulation models for household taxation are increasingly available, e.g. EUROMOD for several EU countries (Lietz and Mantovani 2007) or STSM for Germany (Steiner *et al.* 2005), empirically based microsimulation models for the business sector are still rare, partly due to limited data availability. Examples for research in this area are models developed for the UK and Italy in the context of the EU commission's DIECOFIS project (Parisi 2003).

This section introduces our newly developed microsimulation model BizTax for business taxation in Germany. It is based on individual firms' official local business tax files. Thus, it represents the heterogeneity of enterprises in Germany with respect to key variables. We use the latest data wave available which consists of tax files for the year 2001.⁹ This data base enables us to calculate each firm's local business tax liability. After having corrected a few cases with obviously erroneous data, the simulated tax liability for 2001 equalled the actual tax liability for that year given in the data in 99.978 % of the firms; the remaining firms were negligible in terms of their tax liability. After this initial data editing, we drew a 10 % stratified random sample (247,314 observations) from the full set of local business tax files to make the computationally intensive simulation and further analysis manageable. As large enterprises have a potentially high impact on total local business tax revenues (with or without a reform), a higher sampling probability was chosen for enterprises with either a higher local business tax base in 2001 or, more generally, with a higher value added from business. The biggest enterprises were completely included in the sample.

The local business tax statistics provide all the variables needed to simulate each firm's local business tax liability for the governing law from 2001 to 2007.¹⁰ They also include the wage

⁹ The next wave of official local business tax statistics will cover 2004.

¹⁰ The deduction of the local business tax from its own tax base is calculated using the iteration method, which is flexible with regard to tax reforms.

expenses and the value of fixed assets, which are important to simulate the local business value-added tax and the local property tax.¹¹

As mentioned in section 2.3, liberal professionals and farmers are exempted from the local business tax today and are therefore not included in the local business tax statistics. We use information about individuals with income from a liberal professional or farming activity from a representative 10 % stratified random sample from the official personal income tax (PIT) files for 2001. The task was to generate data sets which represent the firms of these individuals in order to add them to our data base. If the liberal professional or farmer is operating alone, the profit of the firm equals his or her individual income from the mentioned activities which is given in the PIT files. These files also inform if a taxpayer is active in a business partnership, but not how many parties are involved. To generate a corresponding data set representing a partnership in such a case, we assigned a number of parties to it randomly in a way that replicates the distribution of the number of parties in partnerships in Germany. The distribution was obtained from statistics about partnerships in Germany (Federal Statistical Office 2001). We adjusted the generated partnership's sampling weight according to the number of partners and its profit assuming that it was distributed uniformly over the partners within the partnership. Furthermore, the PIT files lack some information necessary to calculate the local business tax base, e.g. interest expenses. These variables were imputed from groups of comparable firms included in the local business tax statistics.¹² Finally we drew a 10 % stratified random sample again, analogously to our sample from the local business tax statistics, and added 124,166 observations representing the firms of the liberal professionals and farmers to our data base.

Using the combined data base, we want to simulate the effects of different tax reform options in the year 2008, the year the actual German business tax reform comes into effect. Thus, the cross sectional data for 2001 must be updated to reflect the situation of German enterprises in 2008. We identify changes in the German business sector's composition with respect to industries and legal forms using the yearly turnover tax statistics. This allows us to adjust the

¹¹ A number of firms obviously did not fill in information on these two variables correctly, however. The tax authorities did not make inquiries in these cases, as these items were not needed for the tax assessment. Thus, we replaced implausible extreme values with imputed values following Zwick (2006). Furthermore, rents, leasing rates and interest expenses for short term liabilities are not included in the data and were imputed as in Zwick et al. (2003).

¹² As firms with cost structures comparable to liberal professionals we drew on business, tax and engineering consultancies, as far as they are included in the local business tax statistics, as well as insurance agents. For farmers the manufacturing sector was used.

weights of the firms in the data base such that it represents the changed proportions in the population with respect to these characteristics. Furthermore, the relevant variables such as profits and interest expenses are scaled up to reflect the changes in the corresponding aggregates reported by the national accounts (Federal Statistical Office 2001-2006) and the corporate balance sheet statistics (Bundesbank 2004-2007). The German government's medium term projection (Federal Ministry of Economics and Technology 2006) is used for extrapolation after 2006.

Based on the edited and extrapolated data, we use the microsimulation model to simulate the reform options discussed in section 2.3 for the year 2008, including the main components of the business tax reform 2008.¹³ The law of 2007 (before the business tax reform 2008) is used as the reference scenario for the determination of the fiscal and distributional effects of the reform scenarios. This allows us to compare the effects of the business tax reform 2008 with the other reform scenarios.

The strengths of microsimulation models such as BizTax are the detailed implementation of the tax legislation and reform options, the representative incorporation of the real world's heterogeneity, and the ability to split the fiscal effects of tax reforms by detailed group characteristics. The model currently does not predict behavioural responses of companies which may be triggered by tax reforms, e.g. changes in financing and investment decisions or entry and exit. The simulation results can thus be characterised as first round effects, i.e. before firms may adjust their behaviour. As such behavioural responses normally take some time, this approach is especially suitable for short term analyses. Further, the model can determine the fiscal effects of assumed behavioural responses.

4 Empirical Results

Table 3 shows the fiscal and distributional effects of the reform options for local business taxation which we discussed in section 2.3. The leftmost column displays the local business tax revenue in millions of euro if the law of 2007 is applied to the extrapolated data for 2008. This is the reference scenario. The six columns to the right show the increase or decrease of

¹³ In case of consolidated companies, the local business tax statistics only report the tax base of the subsidiaries, but not its components (profits, long term interest expenses etc.). To translate the effects of a tax reform (and also of the extrapolation) to the subsidiaries, we adjust their tax base proportionally to the change in the tax base of non-consolidated companies (separately for different industry groups).

the revenue relative to the reference scenario if the respective reform option were in effect in 2008.¹⁴ The table splits the overall fiscal effect by categories of profit before tax, number of employees, industries and legal forms.

First of all it is interesting to look at the revenue distribution if the law of 2007 is applied. 73 % of the revenue comes from enterprises with profits above € 1 million, and still 57 % from those above € 5 million. Consistent with this, 57 % of the revenues stem from corporations. Partnerships account for almost a third of local business tax revenues, which reflects their high significance in Germany. Revenues from companies with losses are negligible in spite of the addition of half of the long-term interest expenses to the tax base. The revenue distribution gives support to the view of the German local business tax as a tax for corporations with high profits. If the company size is measured in terms of the number of employees, however, revenues are distributed quite uniformly across the classes. This indicates that firms with a large number of employees do not necessarily realise high profits.

For the actual business tax reform 2008 the simulation results indicate a decrease in local business tax revenue of 9.2 % in comparison to the law in 2007. The modified rules for the determination of taxable profits are neglected, however, since reliable data, in particular concerning cost accounting, are not available. The Federal Ministry of Finance estimates that the business tax reform 2008 does not change the overall local business tax revenue if all measures are taken into account (Bundestag 2007).¹⁵ The distribution of the simulated revenue effects by profits before taxes shows that primarily highly profitable corporations benefit from the reduction of the basic federal tax rate from 5 % to 3.5 %. Companies with losses pay more local business taxes due to the changed rules for the inclusion of financing expenses. Significantly more revenue is levied on small firms with less than 10 employees or profits between the allowance of €24,500 and €72,500 because of the abolishment of the reduced basic tax

¹⁴ In this paper, we only consider the local business tax ("Gewerbesteuer", sometimes also called "Trade Tax") and not its effects on the corporation income tax and the personal income tax (PIT) through its deductibility as a business expense and the lump sum credit against the PIT of sole proprietors and partners of non-incorporated firms. In general, a higher (lower) local business tax leads to lower (higher) revenues from these federal taxes. As a minor share of the PIT revenues is allocated to local jurisdictions, the local fiscal impact of reforms of the local business tax would partly be compensated. Financial equalisation schemes between the jurisdictions of the local, state and federal levels are not considered in this analysis either. They would lead to a further levelling of the distributional effects.

¹⁵ Not considering the corporation and personal income tax and financial equalisation.

Table 3 Revenue Effects of Reform Scenarios of the Local Business Tax in 2008 by Profit before Taxes, Number of Employees, Industries, and Legal Forms

	Local Busin. Tax Revenues If Law of 2007 Is Applied	Actual Business Tax Reform 2008 ¹⁾	Inclusion of Freelance Professionals and Farmers ²⁾	Local Business Income Tax	Comprehensive Business Income Tax (CBIT)	Local Business Value-Added Tax	Local Property Tax
	Mill. €	Increase (+) / Decrease (-) of Local Business Tax Revenues in %					
Total	37 777	- 9.2	0.0	0.0	0.0	0.0	0.0
By Profits Before Taxes in €							
Enterprises Reporting Losses, Total	245	+ 27.5	- 15.3	- 45.5	+ 798.5	+3 902.6	+2 334.3
Under - 1 000 000	164	+ 21.0	- 17.0	- 38.7	+ 734.8	+3 121.9	+2 107.3
- 1 000 000 - - 250 000	40	+ 33.3	- 12.7	- 48.2	+ 693.3	+4 386.6	+1 782.7
- 250 000 - - 50 000	22	+ 49.5	- 8.6	- 58.9	+1 184.3	+6 308.5	+4 162.4
- 50 000 - 0	19	+ 46.5	- 14.2	- 83.2	+1 118.9	+6 813.3	+3 309.2
Enterprises Reporting Profits, Total	37 532	- 9.4	+ 0.1	+ 0.3	- 5.2	- 25.5	- 15.3
0 - 25 000	218	- 17.8	- 18.5	- 37.1	+ 115.0	+1 100.5	+ 202.8
25 000 - 50 000	507	+ 67.1	+ 127.0	+ 113.2	+ 158.5	+ 121.8	+ 140.3
50 000 - 100 000	1 544	+ 31.6	+ 94.3	+ 91.4	+ 92.9	+ 20.3	+ 24.8
100 000 - 250 000	3 078	- 4.0	+ 70.3	+ 70.0	+ 56.6	+ 51.2	+ 36.6
250 000 - 500 000	2 285	- 13.1	+ 48.3	+ 48.0	+ 35.2	- 8.4	+ 23.7
500 000 - 1 000 000	2 287	- 15.0	+ 14.4	+ 13.9	+ 5.0	- 20.5	- 18.0
1 000 000 - 5 000 000	6 033	- 14.8	- 12.1	- 12.4	- 18.9	- 33.9	- 27.8
5 000 000 and more	21 579	- 12.3	- 22.7	- 21.4	- 27.7	- 54.6	- 31.8
By Number of Employees							
Under 10	6 501	+ 8.2	+ 65.7	+ 65.0	+ 62.8	- 9.9	+ 48.9
10 - 50	8 909	- 14.4	+ 0.8	- 0.2	- 0.8	- 20.6	- 0.6
50 - 250	7 666	- 15.7	- 13.1	- 13.5	- 17.3	- 31.4	- 12.2
250 - 500	2 639	- 13.3	- 23.2	- 22.4	- 25.4	- 32.3	- 28.4
500 - 2 000	5 274	- 12.0	- 22.8	- 21.5	- 24.0	- 31.3	- 15.3
2 000 and more	6 787	- 7.8	- 22.5	- 21.3	- 11.1	+ 108.8	- 9.5
By Industries							
Agriculture, Forestry, and Fishery	287	- 10.8	+ 161.5	+ 150.5	+ 236.3	+ 157.1	+ 56.2
Mining and Quarrying	230	- 13.6	- 19.7	- 19.9	- 25.3	- 25.6	- 39.1
Manuf. of Intermed. / Non-Durable Goods	6 547	- 11.8	- 21.4	- 20.9	- 24.5	- 30.6	- 39.6
Manuf. of Investment / Durable Goods	6 062	- 13.0	- 21.7	- 21.5	- 25.7	+ 1.1	- 34.1
Electricity, Gas and Water Supply	1 897	- 13.7	- 22.7	- 23.2	- 23.7	- 63.0	- 23.1
Construction	1 261	+ 0.6	- 6.8	- 8.1	- 7.2	+ 107.8	- 5.6
Trade, Maintenance and Repair	6 642	- 8.6	- 15.5	- 16.0	- 19.9	- 23.6	- 40.7
Hotels and Restaurants	396	+ 13.7	+ 8.6	+ 4.7	+ 16.5	+ 156.7	- 3.7
Transport, Storage and Communication	1 267	- 10.7	- 15.0	- 23.4	+ 9.9	+ 42.3	+ 8.0
Financial Intermediation	4 296	- 9.2	- 20.0	- 16.9	- 30.1	- 11.7	- 34.8
Real Estate and Renting	2 109	- 11.2	- 8.8	- 13.8	+ 30.1	- 36.4	+ 117.0
Business Service Activities	5 568	- 4.9	+ 23.8	+ 25.8	+ 29.3	+ 28.4	+ 87.4
Public and Personal Service Activities	1 216	- 3.1	+ 305.1	+ 308.6	+ 266.0	+ 121.0	+ 152.7
By Legal Forms							
Sole Proprietorships	3 996	+ 18.9	+ 143.8	+ 144.1	+ 127.4	+ 30.2	+ 58.5
Partnerships	12 329	- 11.7	- 6.1	- 6.4	- 7.2	- 13.1	- 0.5
Corporations	21 452	- 13.0	- 23.3	- 23.1	- 19.6	+ 1.9	- 10.7
Basic federal tax rate³⁾	5.00%⁴⁾	3.50%	3.63%	3.25%	2.93%	0.83%	1.83%⁵⁾
1) Excluding modified rules for the determination of taxable profits.- 2) Including the abolishment of reduced basic tax rates for enterprises with low profits.- 3) Municipalities apply a multiplier, which is 390% on average, to their allocated share of the uniform basic tax.- 4) Reduced basic federal tax rates apply for enterprises with taxable income below € 72,500.- 5) Applied to 10 % of the value of business properties. Source: Calculations based on the microsimulation model for business taxation BizTax.							

rates for businesses reporting profits in this range. The tightened profit determination rules may have a stronger impact on firms with high profits than on small firms and thus at least partly compensate these effects.¹⁶

The remaining five hypothetical reform scenarios adopt the abolishment of the reduced basic tax rates for small firms from the actual business tax reform 2008. The resulting flat basic federal tax rate is chosen such that the total local business tax revenue is held constant. This makes the distributional effects of the reform options comparable.

In the first of these scenarios, liberal professionals and farmers are integrated in the local business tax. The simulation results show that this reform increases the revenue from enterprises with low and medium profits up to €1,000,000. The percentage increase is highest for the profit category just above the allowance of €24,500 and below €50,000 (+127 %) and decreases with higher profit classes. This reflects the profit distribution of liberal professionals. As in the actual business tax reform 2008, the abolishment of the reduced basic tax rates adds to the increased revenue collected from small firms. In contrast, large enterprises benefit from the reduced basic federal tax rate (3.632 % instead of 5 %) that offsets the broader tax base and makes the reform scenario revenue neutral. Municipalities dominated by personal service industry or agriculture and forestry can expect higher local business tax revenues in this scenario.

The local business income tax shows similar effects because it likewise includes liberal professionals and farmers. As only operating profits are subject to taxes, almost no revenues are collected from companies with losses.¹⁷ The revenue neutral basic federal tax rate is 3.253 %. It is lower than in the scenario discussed before because the local business income tax is not deductible from the tax base.

The comprehensive business income tax (CBIT) includes all financing expenses in the tax base. Thus, in contrast to the local business income tax, revenue is levied on companies with losses or with profits below the allowance of €24,500 if their earnings before interests and taxes (EBIT) exceed the allowance. This leads to a sharp increase in revenue especially from companies with reported losses. The basic federal tax rate can be decreased to 2.934 % due to

¹⁶ For a detailed analysis focussing specifically on the German business tax reform 2008, including the changes to the corporation tax, see Bach, Buslei, Dwenger and Fossen (2007).

¹⁷ A company that reports overall losses may still be subject to local business income tax if its operating profits are positive and above the allowance.

the broader tax base. Again, large and profitable corporations benefit from this tax rate reduction. Taxes levied on the financial intermediation industry decrease by 30 %.

The local business value-added tax additionally includes the sum of wages and salaries in the tax base. To compensate for the much broader tax base, the basic federal tax rate is decreased to only 0.832 % and the allowance is increased to €36,000 (see section 2.3). The inclusion of wages and salaries leads to an even stronger increase of revenue from enterprises making losses or profits below the allowance than the CBIT. The revenue from companies with more than 2000 employees more than doubles, while the revenue from companies with fewer employees decreases significantly. On the other hand, less tax is levied on companies with profits above €1,000,000. This shows that the business value-added tax is clearly dominated by the sum of wages and salaries in comparison to the other components of the tax base, i.e. profits and financing expenses. In contrast to the other scenarios, revenues collected from the construction industry and hotels and restaurants more than double, while revenues from electricity, gas and water supply decrease by 63 %.

The local property tax also sharply increases revenues from companies making losses or profits below the allowance of €24,500, but not as much as the local business value-added tax. Again, less revenue is collected from firms with high profits. The revenue neutral basic federal tax rate is 1.832 %. In contrast to the other scenarios, taxes paid by the real estate and renting industry more than double.

Table 4 shows the distributional effects of the reform scenarios with respect to regional categories. In the upper part of the table, the effects are first split by western and eastern Germany and second by cores of agglomeration, surrounding and rural areas. The lower part displays the effects by regions with high, medium or low local tax revenues per capita.¹⁸ The first column shows the distribution of local business tax revenues in millions of euro if the law of 2007 is applied. The second column gives the local business tax revenue per capita in the different regional categories. Local business tax per capita is only €248 in eastern Germany versus €512 in western Germany, which reflects that eastern Germany still lags behind in terms of productivity and profitability. As the next column shows, the actual business tax

¹⁸ The categories “core of agglomeration”, “surrounding area” and “rural area” refer to definitions by the Federal Office for Building and Regional Planning (2007). These definitions are also the basis for the categorisation by local tax revenue per capita, which was set up by the German Institute of Urban Affairs (Reidenbach 2007). Local tax revenues per capita are classified as low if revenues per inhabitant were less than 80 % of the average in the same type of municipality in the period 2002 to 2005, and high if revenues per inhabitant exceeded 120 %.

reform 2008 decreases local business tax revenues in eastern Germany by 0.8 percentage points more than in western Germany (again, not taking into account the tax base broadening measures of this reform). The other five hypothetical reform options, which are revenue neutral, all increase revenues in eastern Germany and decrease revenues in western Germany. This effect is strongest when the local business value-added tax is applied, which increases taxes collected in eastern Germany by 59 % and decrease those collected in western Germany by 7.2 %.

Table 4 Revenue Effects of Reform Scenarios of the Local Business Tax in 2008 by Regional Categories

Regional Categories ¹⁾	Local Busin. Tax Revenues If Law of 2007 Is Applied	Local Business Tax per Capita ²⁾	Actual Business Tax Reform 2008 ³⁾	Inclusion of Freelance Professionals and Farmers ⁴⁾	Local Business Income Tax	Comprehensive Business Income Tax (CBIT)	Local Business Value-Added Tax	Local Property Tax
	Mill. €	€	Increase (+) / Decrease (-) of Local Business Tax Revenues in %					
Germany, Total	37 777	458	- 9.2	0.0	0.0	0.0	0.0	0.0
Western Germany ⁵⁾ , Total	33 629	512	- 9.1	- 1.2	- 0.9	- 2.3	- 7.2	- 2.5
Cores of Agglomeration	17 752	753	- 8.3	- 6.6	- 4.9	- 7.5	- 12.9	+ 0.6
Surrounding Areas	8 956	396	- 9.8	+ 5.4	+ 4.5	+ 3.6	- 11.4	- 5.9
Rural Areas	6 920	355	- 10.2	+ 4.1	+ 2.6	+ 3.4	+ 12.5	- 5.9
Eastern Germany ⁶⁾ , Total	4 151	248	- 9.9	+ 9.2	+ 7.6	+ 19.5	+ 58.5	+ 20.7
Cores of Agglomeration	2 198	325	- 9.0	+ 8.6	+ 9.1	+ 14.7	+ 11.2	+ 21.1
Surrounding Areas	738	264	- 13.3	+ 3.5	- 0.2	+ 18.3	+ 57.0	+ 9.6
Rural Areas	1 214	169	- 9.4	+ 13.6	+ 9.5	+ 28.9	+ 145.1	+ 26.6
High Local Tax Rev. per Capita	18 909	892	- 10.0	- 11.1	- 10.3	- 12.3	- 21.5	- 7.0
Med. Local Tax Rev. per Capita	12 638	392	- 8.7	+ 9.8	+ 9.6	+ 8.8	+ 11.7	+ 3.0
Low Local Tax Rev. per Capita	6 233	215	- 7.7	+ 13.4	+ 12.2	+ 20.0	+ 41.4	+ 15.5

1) Local tax revenues per capita: low if revenues per inhabitant were less than 80% of the average in the same type of municipality in 2002 to 2005, high if revenues exceeded 120% (Reidenbach 2007). - 2) Inhabitants at the end of 2005. - 3) Excluding modified rules for the determination of taxable profits. - 4) Including the abolishment of reduced basic tax rates for enterprises with low profits. - 5) Old federal states excluding West Berlin. - 6) New federal states including Berlin.
Source: Calculations based on the microsimulation model for business taxation BizTax.

Today, local business tax revenues are highly concentrated in cores of agglomeration in western Germany. In the reference scenario they account for 47 % of total local business tax revenues. Except for the local property tax, the hypothetical reform options reduce this concentration by decreasing revenues in cores of agglomeration in western Germany and increasing revenues in rural areas, especially in eastern Germany. All of the five hypothetical reform scenarios decrease revenues in municipalities with high local tax revenues per capita and increase revenues in municipalities with low or medium revenues per capita, and the increase is relatively higher in the low than in the medium revenues category. This confirms that these

scenarios distribute local tax revenues more equally across regions. The results are driven to a large extent by the inclusion of liberal professionals in the local business tax. Physicians, lawyers or tax counsellors, for example, are not necessarily concentrated in cores of agglomeration, but distributed quite evenly in surrounding and even rural areas, and would therefore contribute to revenues in these regions if they became liable to local business tax.

5 Summary and Conclusion

The taxation of local business to generate revenues for local governments is common in OECD countries. Local authorities usually have some discretion over the tax rate. The international comparison reveals that the composition of the tax base varies widely. Local business tax systems range from a pure profit tax in Luxembourg and Japan to an origin-based value-added tax in Italy and Hungary, which includes interest expenses and the payroll in the tax base. France and some states in the USA tax fixed assets of companies at the local level. As general options for the design of local business taxation we identify a local business income tax, a local CBIT, a local business value-added tax, or a local property tax.

Using our newly developed microsimulation model for the business sector BizTax, we simulate the distributional effects of these general reform scenarios if they were implemented in Germany in a revenue neutral way in 2008. Liberal professionals and farmers, who are exempted from the local business tax in Germany today, are integrated in these reform scenarios. We find that today's high concentration of local business tax revenues on corporations with high profits decreases if the tax base is broadened by integrating more taxpayers and by including more elements of value added. The reform scenarios with a broader tax base also distribute the local business tax revenue per capita more equally across regional categories, especially by reducing today's high concentration of revenues on cores of agglomeration in western Germany. Revenues from local business taxation in rural areas and in eastern Germany increase.

The results also show that the reform scenarios including components other than profits in the tax base strongly increase the tax revenues collected from companies incurring losses and from small businesses. This does not necessarily imply that these scenarios impose a higher tax burden on sole proprietors or partners of small businesses, however. The local business tax liability is not only a deductible expense in Germany, which reduces the income or corporation tax. Sole proprietors and partners can additionally credit it against their personal in-

come tax in a lump sum. The business tax reform 2008 abolishes the deductibility from the tax base and compensates this by a higher lump sum credit for unincorporated firms. This credit would also apply to liberal professionals and farmers if they were integrated in the local business tax. This certainly increases the political feasibility of including these groups in the local business tax, and of a tax base broadening reform in general, but the tax credit undermines the fiscal equivalence principle. Furthermore, it decreases the transparency of taxation and brings about bureaucracy, and if the federal level is taken into account, the tax reform options are no longer revenue neutral. With or without the credit, a broadening of the tax base of the local business tax in the direction of an origin-based value-added tax or a property tax has the advantage of providing a revenue source for local governments which is more reliable and stable and better matches the needs for local service provision than Germany's current system.

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