# THE COMPUTATION AND COMPARISON OF THE EFFECTIVE TAX BURDEN IN FOUR ASIAN COUNTRIES*

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## Abstract

The Asia-Pacific region has gained economic power among the world's economies and offers enormous sales opportunities for multinational companies. When considering foreign

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direct investment in countries from this region, the specific taxation framework constitutes one determinant to be accounted for. The paper provides a comparative analysis of the corporate tax regimes in four important Asian countries, namely China, India, Japan and Singapore. It is not limited to a comprehensive description of the tax systems, but goes to a detailed analysis of the effective average tax burden, which is relevant for investors' decisions on location, scale and mode of finance of a potential investment. The calculation is based on the European Tax Analyzer. This approach allows capturing different types of taxes borne by corporations, the respective tax bases and tax rates in great detail and hence extends the literature on company taxation in Asia. In addition, we seek to contribute to literate not only by establishing a country ranking based on the overall tax burden, but also by identifying the underlying tax drivers. In doing so, sensitivity analyses are run to examine the effects of altering model assumptions, thereby illustrating the sensitivity of the base case results to selected financial ratios. As corporate income taxes might affect investments in various industry sectors differently, the comparison of the effective average tax burdens is finally extended to corporations representing different industries.

*Keywords:* Effective average tax burden; European Tax Analyzer; Asia.
*JEL-Classification:* H25, O38

# I.    *Introduction*

Asia, as an emerging market, has shown an increasing economic power which can be traced back to the abundant natural and human resources as well as to the enormous sales and growth opportunities for multinational companies. The development of foreign direct investment in Asian countries reflects the attractiveness of this region for multinational investors. Beside these non-tax factors, the country-specific taxation frameworks constitute one determinant to be accounted for in the decision on the location of the investment. In this context multinational investors might need to know in which respect the potential investment locations differ in terms of potential tax risks and opportunities. In literature, however, comparisons of the tax systems in Asia are still rare and a comparative assessment is not yet available. Against this background, the first objective of this paper is to provide a comparison of the company tax regimes in four of the most important Asian countries, namely China, India, Japan and Singapore. Either due to a large domestic market and comparatively low costs of labor (China and India), or to the sophisticated infrastructure and sound judicial system (Japan and Singapore), these countries are attractive for investors when choosing investment location. In 2008, for instance, 68.31% of direct investment from Germany to Asia flows in these four countries.[1] The flow of direct foreign investment from the U.S. to Asia shows a similar pattern.[2]

The comparison is, however, not limited to a comprehensive description of the tax systems, but goes on with a numerical analysis of the tax burdens in the four considered

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[1] See Deutsche Bundesbank, „Bestandserhebung über Direktinvestitionen" http://www.bundesbank.de/statistik/statistik_aussenwirtschaft_direktinvestitionen.php, 2008.
[2] See Bureau of Economic Analyses, "US Direct Investment Abroad", https://www.bea.gov/surveys/diasurv.htm, 2008.

countries. A promising way to deal with the complexity of taxes which does not mitigate the most important features of a tax system beyond statutory tax rates is to calculate effective tax burdens. Effective tax burdens are not only relevant for investors' decisions on location, scale and mode of finance of a potential investment, but also for policy makers demanding simplified but sophisticated information on the impact of their tax policy decisions on economic activity. The calculations are based on the methodology of the European Tax Analyzer, which has been used in a wide variety of similar studies. In contrast to approaches computing tax burdens solely on pre-tax returns, this approach allows to include and account separately for any kind of non-profit tax as well as complicated tax provisions, such as thin-capitalization rules, earning stripping rules or loss-carryovers, in great detail and hence provides valuable insights in the country specific tax drivers. The comparison will, however, be restricted to domestic investment at the level of the subsidiary. Neither the taxes on repatriated dividends from the subsidiary to the parent company, nor the personal taxes of the shareholders are taken into account.[3] This proceeding allows identifying the tax drivers inherent to the respective domestic tax systems and reveals their competitive advantages. The impact of country specific investment incentives is not assessed since these special regimes differ significantly in their prerequisites. To ensure comparability across countries, a general investment pattern is assumed.

The remainder of this paper is structured as follows: Section II presents a description of the methodology and database underlying the measurement of the effective tax burdens. Section III provides a comparative analysis of the corporate tax systems in China, India, Japan and Singapore. In this context, similarities and particularities regarding the types of profit and non-profit taxes, the tax rates and the most important elements of the tax bases are pointed out. In Section IV the effective tax burdens in the four considered countries are analyzed in detail. Furthermore, we examine the sensitivity of the base case results to selected financial ratios. As corporate income taxes might affect investments in various industry sectors differently, the comparison of the effective tax burdens is finally extended to corporations representing different industries. Finally, Section V summarizes the findings.

## II.   *Methodology for the Calculation and Comparison of the Effective Tax Burden*

### 1.   Methodological Requirements

If an international comparison of the tax burden is to have any meaning, it must at least pay heed to the following considerations:[4]

- Relevant taxes
  A comparison of the effective tax burden has to comprise all taxes which have an

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[3] See Endres, D., Fuest, C. and Spengel, C., *Company Taxation in the Asia-Pacific Region, India, and Russia* (Heidelberg, 2010)

[4] For details, see Jacobs, O.H. and Spengel, C.," Measurement and Development of the Effective Tax Burden of Companies - An Overview and International Comparison*", Intertax (2000)*, pp. 334-351; Stetter, T. and Spengel, C., Taxation of Corporations in Canada: A comparison of Tax Burdens with the United States and Selected Member States of the European Union Using the European Tax Analyzer — Part 2, *European Taxation (2006)*, pp. 364-365.

impact on the profitability of an investment. This includes not only the statutory tax rate, but also the characteristics of the national tax systems. Thus, all profit and non-profit taxes levied on the investment as well as their interactions have to be part of the comparison.

• Relevant tax bases

The tax burden is calculated by multiplying the tax rate by the tax base. A comprehensive comparison thus has to involve the most relevant provisions for the bases of assessment affected by the investments whose tax burdens are analyzed. A valid comparison should include at least the provisions which are generally available for a single investment (e.g. depreciation, capital gains taxation), a group of related investments or a multi-period production (e.g. calculation of production costs, stock valuation), and for the company as a whole (e.g. provisions for bad debts).

• Loss compensation

If the periodical result of an investment is negative, not all expenses and deductions result in an immediate tax saving in that period. In this situation, the amount of tax saving rather depends on the rules for loss compensation, i.e. carry-back and carry-forward. As these rules have an influence on the tax burden for different types of investment and also differ materially among countries, they have to be included in a valid comparison.

• Calculation period

Most of the differences between tax burdens relating to the bases of assessment and various tax electives are only temporary (e.g. depreciation and accounting for provisions). A valid and useful determination of the resulting financial effects (interest and liquidity) is, therefore, only possible over a multi-year period.

• Comparisons with identical pre-tax data

Many factors such as the sources of finance, the types of business assets, the sales and the costs — in other words, the entire business policy — are dictated by circumstances and opportunities specific to the country or market. On the one hand, many of these factors are often influenced by taxation[5]. On the other hand, real economic data does not allow the computation and isolation of tax related distortions of competition. The effective tax burden, therefore, can only be calculated on the basis of a model. This requires the assumption of an identical starting point and identical pre-tax data for the alternative projects which are compared.[6]

• Financial consequences of taxation

The measurement of effective tax burdens should be conducive to assess the impact of taxation on managerial decisions (e.g. location, investment, financing, and distribution). This cannot be resolved by applying the tax payments due to taxable or accounting profits, since they are defined legally and thus do not relate to economic decisions. Furthermore, they are not defined uniformly in different countries, meaning that the tax burdens cannot be compared, even though the computed tax payments are the same.

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[5] See Bond, S.R., Devereux, M.P. and Gammie, M.J., *"Tax Reform to Promote Investment"*, *Oxford Review of Economic Policy (1996)*, pp. 109-112.

[6] See King, M.A. and Fullerton, D., "The Taxation of Income from Capital", *University of Chicago Press* (1984), p. 281; and OECD, "Taxing Profits in a Global Economy, an Emerging Global Issue", (1991), pp. 94-95.

Instead, it is necessary to relate the tax burden to relevant financial pre-tax figures, such as financial profits, cash flows and the return on equity or net assets. In order to assess the incentive effects set by taxation, the computation ought to be based upon future but not upon past financial data or profits.

Over the last decades, various measures for comparing the effective tax burdens have been developed. Depending on the purpose of the comparison, it is possible to distinguish between the effective marginal tax burden and the effective average tax burden. The first measures the additional tax of marginal investments which are just worthwhile, i.e. they do not earn more than the cost of capital. Investment decisions, however, often concern inframarginal, profitable investments, i.e. those earning more than the cost of capital. A multinational corporation, for example, would expect to earn an economic rent when deciding over the location of a new plant. Information on the impact of taxation on investment decisions of this type can be derived from the effective average tax burden. Devereux and Griffith[7] find that average effective tax rates are a determinant of foreign direct investment decisions and other empirical studies confirm the high relevance of this measure for location decisions of multinational companies. It is, therefore, the relevant measure for the purpose of this study.

The approach of Devereux and Griffith[8] building on the well-known approach by King and Fullerton[9] can be seen as the standard model for the calculation of effective average tax burdens. On the other hand, model-firm approaches like the European Tax Analyzer have been developed to overcome certain constraints of this standard measure. In their simplest form, they are a firm-specific combination of several investments and sources of finance, taking into account all relevant interrelations between sales, investments, profit distribution etc. Indeed, both approaches meet the above mentioned requirements and provide consistent measures of the effective average tax burden and reliable information on the influence of taxes on investment decisions. Yet, the purpose of this paper is not to discuss the general differences or strength and weaknesses of different tax measures, as this is done in a range of other papers.[10] However, as model firm-approaches allow accounting for all relevant profit and non-profit taxes, statutory tax rates and all tax bases at any time during the period of simulation, they can, in contrast to models which compute tax burdens solely on pre-tax returns, include complicated tax provisions, such as progressive tax rates, thin-capitalization rules or loss-carryovers, without any difficulty. Thus, we use the model-firm approach European Tax Analyzer, which was developed in a joint research project by the Centre for European Economic Research (ZEW) and the University of Mannheim, to compute and analyze the effective average tax burdens of companies.

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[7] See Devereux, M.P. and Griffith, R., "Evaluating Tax Policy for Location Decisions", *International Tax and Public Finance (2003)*, pp. 107-126.

[8] See Devereux, M.P. and Griffith, R., "Evaluating Tax Policy for Location Decisions", *International Tax and Public Finance (2003)*, pp. 107-126.

[9] See King, M.A. and Fullerton, D., "The Taxation of Income from Capital", *University of Chicago Press* (1984), p. 281.

[10] These include Jacobs, O. H. and Spengel, C., "Measurement and Development of the Effective Tax Burden of Companies an Overview and International Comparison", *Intertax (2000)*, pp. 334-352, Nicodème, G., "Comparing Effective Corporate Tax Rates, 2007", *Frontiers in Finance and Economics (2007)*, pp.102-131.

## 2.  The European Tax Analyzer

The European Tax Analyzer[11] is a computer-based model firm approach, calculating and comparing effective average tax burdens for companies facing different tax systems in Europe. The effective average tax burden is derived by simulating the development of a company over the simulation period of ten years. It is expressed as the difference between the pre-tax and post-tax value of the company at the end of the simulation period and states the central outcome variable of the model. The value of the company is represented by its equity, including the capital stock and the cumulative net income generated in each of the ten simulation periods. In order to determine the post-tax value, the tax liabilities of each of the ten periods are derived taking all taxes which may be influenced by investment and financing at the corporate level into account. Consideration is not only given to corporate income taxes but also to all other taxes and surcharges shown in Table 1.

With respect to the tax bases, the most relevant items relating to the assets and liabilities included in the capital stock and the effects of corporate planning are considered. The tax module of the model also permits a choice of various accounting options which allow a company to influence its taxable profits. The rules for profit computation cover:

- depreciation (i.e. the methods and tax periods for all relevant assets, extraordinary depreciation);
- stock valuation (i.e. last-in, first-out (LIFO), first-in, first-out (FIFO), and weighted average cost method; inflation reserves; production costs);
- research and development costs (i.e. immediate expensed or capitalized);
- employee pension schemes (i.e. deductibility of pension cost, contributions to pension funds; book reserves);
- provisions for bad debts and guarantee accruals;
- elimination and mitigation of double taxation on foreign-source income (i.e. exemption and foreign tax credit, deduction of foreign taxes);
- thin-capitalization rules, earning stripping rules ;
- notional interest deductions; and
- loss relief (carry-back and forward).

Depending on the tax rules which are to be applied, the tax value of assets and liabilities may differ from their fair value at the end of period ten. These unrealized profits and liabilities are added to the taxable income in period ten and are taxed accordingly. Therefore, only the effects of different tax accounting rules on liquidity are taken into account. In order to fully capture the effects of different loss relief rules, remaining loss- carry forwards are liquidated at the end of the simulation period. A devaluation of 50% of its nominal value is applied if there are no restrictions for the use of the carry-forward and a devaluation of 75% if there are restrictions.

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[11] See Oestreicher, A., Spengel, C. and Reister, T., "Common Corporate Tax Base and Effective Tax Burdens in the EU Member States", *World Tax Journal (2009)*, pp. 46-66. For detailed descriptions of the model and the computer-software see Spengel, C., *Europäische Steuerbelastungsvergleiche*, (Düsseldorf, 1995); Jacobs, O.H. and Spengel, C., *European Tax Analyze*r, (Baden-Baden,1996); Meyer, R., *Computergestützte Simulation von Steuerbelastungen*, (Baden-Baden,1996); Stetter, T., *Computergestützte internationale Steuerbelastungsvergleiche*, (Lohmar,2005); Gutekunst, G., *Steuerbelastungen und Steuerwirkungen bei nationaler und grenzüberschreitender Geschäftstätigkeit*, (Lohmar, 2005).

TABLE 1.   CONSIDERED TAXES IN EACH COUNTRY

| Country | China | India | Japan | Singapore |
|---|---|---|---|---|
| Profit taxes | √ | √ | √ | √ |
|   Corporate income tax | √ | √ | √ | √ |
|   Surcharge on corporate income tax | | √ | √ | |
|   *(Inhabitants tax on income)* | | | | |
|   Education cess | | √ | | |
|   Enterprise tax on income | | | √ | |
|   Enterprise tax on "Value Added" | | | √ | |
|   Special local tax on income | | | √ | |
|   Dividend distribution tax | | √ | | |
| Real estate tax | √ | √ | √ | √ |
|   Business office tax on floor space | | | √ | |
|   City planning tax | | | √ | |
|   House property tax | √ | | | |
|   Land use tax | √ | | | |
| Other non-profit taxes | | | √ | |
|   Business office tax on payroll | | | √ | |
|   Enterprise tax on capital | | | √ | |
|   Inhabitants tax on capital | | | √ | |
|   Property tax | | | √ | |

## 3.   Structure of the Model Firm and Other Economic Assumptions

Within this conceptual framework, the model uses empirical data mainly taken from the AMADEUS database[12] to determine an EU-27 average company. The database provides financial and supplementary information for about 6.74 million companies in the European Union (Update 125 as of February 2005). We use data from 19,211 companies comprising financial data for the years 1994 to 2004. All others are not relevant in terms of size, legal forms (e.g. partnerships), industries (e.g. mining) or ownership (e.g. publicly owned). The implemented EU-27 average company thus represents a model of a firm ignoring country and industry specific effects on pre-tax data, which means that the balance sheet, the profit and loss account and the corporate planning of this model company are given and independent from country-specific taxation rules. For the sake of comparability, it is assumed that this model-firm shows identical financial ratios before any taxation in each considered country. As a consequence, differences between the pre-tax and post-tax data can be solely attributed to differing tax rules in the considered countries. Tables 2 and 3 set out the balance sheet of the generated EU-27 average company and its most important financial ratios. It depicts the different types of investments and their sources of finance and highlights the relative weight of these investments and the source of finance. Please note that the use of the EU-27 average pre-tax data is not only a matter of availability, but also of comparison with the effective tax burdens in the EU Member States, which were calculated on the same set of assumptions[13].

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[12] The AMADEUS database (Bureau van Dijk Electronic Publishing (http://www.bvdep.com/de/AMADEUS.html)) provides financial and supplementary information for about 6.74 million companies in the European Union. For details see Oestreicher, A., Spengel, C. and Reister, T., "Common Corporate Tax Base and Effective Tax Burdens in the EU Member States", *World Tax Journal (2009)*, pp. 46-66.

TABLE 2.   TAX BALANCE SHEET FOR THE IMPLEMENTED EU-27 MODEL FIRM
(PERIOD SIX OF TEN)

| Assets | | | EUR | Equity and Liabilities | | EUR |
|---|---|---|---|---|---|---|
| A. | Fixed Assets | | | A. Equity | | |
| | I. | Intagible Assets | 2,875,872 | I.Subscribed capital | | 18,207,742 |
| | II. | Tangible Assets | | II.Revenue reserves | | 21,082,256 |
| | | 1. Land and buildings | 16,129,763 | III.Net profit/Net loss | | 4,124,827 |
| | | 2. Technical equipment and machinery | 15,870,976 | B. Provisions | | |
| | | 3. Factory and office equipment | 5,792,704 | I. Provisions for pensions and similar obligations | | |
| | III. | Financial Assets | | II. Other provisions | | 6,185,594 |
| | | 1. Participating interests | 8,075,041 | C. Creditors | | |
| | | 2. Long-term receivables | 897,227 | I. Long-term bank loans | | 21,248,099 |
| B. | Current Assets | | | II. Amounts owed to shareholders | | 21,248,099 |
| | I. | Stocks | 22,936,037 | III. Trade creditors | | 10,070,619 |
| | II. | Trade debtors | 15,945,781 | IV. Short-term bank loans and overdrafts | | 24,266,515 |
| | III. | Securities | | | | |
| | IV. | Cash, bank balances | 37,910,647 | | | |
| TOTAL | | | 126,434,049 | TOTAL | | 126,434,049 |

TABLE 3.   FINANCIAL RATIOS FOR THE IMPLEMENTED EU-27 MODEL FIRM
(PERIOD SIX OF TEN)

| Financial ratios | Benchmark case |
|---|---|
| Profit / loss for period | 4,124,827 EUR |
| Total assets | 126,434,049 EUR |
| Turnover | 159,457,817 EUR |
| Share of tangible fixed assets (capital intensity) | 29.89% |
| Return on turnover | 2.59% |
| Return on equity | 9.50% |
| Equity ratio | 34.34% |
| Return on assets | 6.11% |
| Inventories to capital (inventory intensity) | 18.14% |
| Costs for personnel to turnover (labor intensity) | 20.97% |

Notably, the use of the EU-27 data does not limit the scope of the model, which, in principle, allows the use of any country-specific pre-tax data.

The procedure of the European Tax Analyzer computation requires various estimates in order to define and describe the model firm and the economic conditions which are assumed to prevail. For the production and sales, acquisition of goods, staff expenditure, other receipts and expenses (e.g. expenses for R&D), investment, distribution, and cost of financing, we derive all required information from the EUROSTAT and the BACH-Database. Regarding the macroeconomic data, different inflation rates, credit and debit interest rates, and exchange rates and cost

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[13] For the effective tax burdens in the EU Member States, see Oestreicher, A., Spengel, C. and Reister, T., "Common Corporate Tax Base and Effective Tax Burdens in the EU Member States", *World Tax Journal (2009)*, pp. 46-66.

of energy are considered. Finally, several important assumptions have to be made:

- expected economic lifetime for assets: 50 years for both production buildings and office buildings; 5 years for patents and concessions; 4 years for plant and 5 to 10 years for machinery; 9 years for office furniture and fixtures; zero for both financial assets and stocks;
- depreciable assets are assumed to be run down at the end of their expected economic life and replaced with new assets, based on the historical cost of the deposited assets adjusted for inflation. Thus, the initial capital stock remains at least constant;
- the goods produced are assumed to be either stocked or sold on the market in the period of production, so multi-period production is possible;
- inflation rates: 2.2% of consumer price index, 4.8% of price index for basic material, 0.8% of price index for wages, and 2.3% of price index for investment goods[14];
- interest rates for creditors and debtors: 3% for short term credit, 3.9% for long term credit, 5.9% for short term debt, and 5.1% for long term debt[15];
- currency exchange rates as of 1 January 2009: 1 EUR equals 9.659 CHY, 68.902 INR, 128.483 JPY and 2.032 SGD respectively[16].

## III.   *Descriptions on the Taxation of Corporations in China, India, Japan and Singapore*[17]

### 1.   Corporate Income Tax

(1) Statutory corporate income tax rates

Table 4 sets out the statutory corporate income tax rates in each country as in fiscal year 2009. With the lowest tax rate of 18% in Singapore and both India and Japan levying the highest rates of 30%, the spread in the four Asian countries is 12 percentage points. All countries, but Singapore, where companies are entitled to a 75% exemption of the nominal tax rate of 18% for the first 10,000 SGD of taxable income and a 50% exemption on the next 290,000 SGD, levy proportional rates on the corporate income. The Chinese tax rate, however, can be reduced to 20% for a low-profit enterprise with annual taxable income less than 300,000 CHY. Furthermore, in Japan a special tax rate of 22% is applicable to taxable income on the first 8 million JPY only if the paid-in capital of the company is equal to or less than 100 million JPY. In contrast, Indian companies must pay income tax at 10% on their book profits (minimum alternative tax) if the corporate income tax liability of an Indian company is less than 10% of the book profits.

In addition, local inhabitant tax[18], charged by both prefectures and municipalities, is levied

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[14] See ECB, *ECB and Eurostat calculations*, (Frankfurt am Main, 2006)

[15] See ECB, *MFI interest rate statistics, December 2006*, (Frankfurt am Main, 2006); OECD, *Financial indicators MEI*, (Paris, 2006).

[16] The information is derived from http://www.x-rates.com.

[17] This article uses the information on the tax systems in operation as of January, 1 2009. The information is derived from IBFD database (http: //www.ibfd.org) and detailed questionnaires answered by PricewaterhouseCoopers AG, Frankfurt, Germany.

TABLE 4.   STATUTORY CORPORATE INCOME TAX RATES IN THE
CONSIDERED COUNTRIES

| Country | Statutory corporate income tax rates | Surcharge on corporate income tax |
|---------|--------------------------------------|-----------------------------------|
| China | 20% / 25% | − |
| India | 30% / minimum alternative tax 10% | Surcharge 10% Education cess 3% |
| Japan | 22% / 30% | Inhabitants tax 17.30% |
| Singapore | 4.50% / 9% / 18% | − |

as a percentage of national corporation tax in Japan. The applicable rates depend on the prefecture and the municipality in which the corporation is located. The standard rates are 5% for the prefectures and 12.30% for municipalities, leading to an overall standard rate of 17.30%.

In India a 10% surcharge, calculated as a percentage of the amount of corporate income tax, applies to domestic companies if income exceeds 10 million INR. The surcharge is also subject to an education cess, which is imposed on the income tax payable (including surcharge) in all cases.

(2) Corporate income tax base

With reference to the corporate income tax base, there are many differences between particular accounting and valuation rules. Nevertheless, in all considered countries tax systems follow international taxation standards and profits liable to corporate income tax are determined on the basis of financial accounting standards and are adjusted to a different extent to obtain the corporate income tax base. In China, India and Japan resident corporations are taxed on their worldwide income. In contrast, Singapore taxes income based on the concepts of territoriality and receipts, meaning that profits are only taxable if derived from domestic sources. All countries, however, have in common that the tax base is based upon the accrual principle. Since the regulations regarding the tax base differ significantly between the considered countries, the aim of this section is to take a closer look at the most important elements of the taxable income, most of which are taken into account in the calculation of the effective tax burdens in Section IV. Table 5 provides an overview of the regulations implemented in the model.

• **Depreciation**

In all four countries, capital allowances are granted with respect to the capital expenditure incurred by a taxpayer on assets used in its business. Such assets include buildings, plant and machinery and intangibles such as patents, trademarks or licenses. Nevertheless, wide variations concerning the method of depreciation and the (statutory) useful lives can be observed in the considered countries.

In China depreciation is calculated on an annual basis, generally using the straight-line method subject to certain minimum depreciation periods. The minimum period over which buildings may be written down is 20 years. Machinery and equipment may be depreciated at a rate of 10%. A minimum period of 10 years also applies to trademarks and patents.

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[18] Beside the so called "corporation tax levy", which is imposed on the amount of national corporation tax, inhabitants tax is also levied on the paid-up capital of the corporation (see Section III.3).

The only method of depreciation which may be used by companies located in India is the declining-balance depreciation. The depreciation rate on buildings other than those used for residential purposes is 10%. Plant and machinery may be depreciated at a rate of 15%. In addition, an initial allowance of 20% of the actual cost may be available for new plant and machinery acquired on or after April 1, 2005. Intangible assets such as patents and licenses may be written down at a rate of 25%.

Japanese companies may generally depreciate their capital assets using either the straight-line or the declining-balance method. Once the annual depreciation amount using the declining-balance method is less than the one calculated under the straight-line method, a switch over to the straight-line method is allowed. For buildings acquired after March 31, 1998, however, only the straight-line method is applicable. The useful life varies with the type of building and is 50 years for office buildings and 38 years for any factory building. The same holds true for patents and licenses, which may be written down over their statutory useful life of 8 years. For tangible assets other than buildings, the straight-line method based on the statutory useful life of the assets or a 250% declining-balance method is applicable. Taxpayers filing a blue return[19] are also eligible to claim increased initial depreciation and accelerated depreciation under certain conditions.

In Singapore, incurred capital expenditure may be written down only on a straight-line basis. Furthermore, an initial allowance is granted in the year of acquisition. Industrial buildings are depreciated at a rate of 25% in the first year plus an annual allowance of 3%. Offices are not considered as industrial buildings and do not qualify for a capital allowance. The initial allowance for manufacturing and industrial-processing plant and machinery amounts to 20% with an annual allowance of 13.3%; however, an accelerated annual allowance of 33.33% for capital expenditure on plant and machinery excluding motor cars, motor cycles and goods vehicles is granted. For capital expenditure on intangibles acquired on or after November 1, 2003, the writing down period is set to 5 years.

• **Production costs and inventory valuation**

In the benchmark case, the production costs for the finished goods or work in process are calculated according to the national accounting standards and available valuation options are taken into account. In India, manufacturing, administration and distribution costs are all mandatorily included in the production costs; in China, production costs have to entail an appropriate allocation of administration expenses in the manufacturing overheads; Japan and Singapore grant a specific valuation option which the model firm has exercised in the interest of tax minimization and thus only manufacturing expenditure must be considered.

The extent to which these differences in production costs can affect the value of the inventories depends on the allocation method for inventories (e.g. average-cost method, fifo or lifo) applied in each country and the storage period. As long as the price level increases and the stock of goods does not decrease, the lifo-method is advantageous. Items most recently purchased at the higher price are matched against revenues. Hence, the tax base decreases and corporate income tax will be deferred. None of the considered countries, however, accept the lifo-method. China, India and Singapore provide the option to use the average-cost method,

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[19] A corporation is entitled to file a blue return if its application is approved by the Director of the District Tax Office, under the condition that the books are maintained in accordance with official requirements.

while in Japan this method as well as the lifo-method are no longer permitted.

• **Pension costs**

The rules of the national tax codes for the deductibility of pension costs are rather complex. In principle, the deductibility relies on the manner in which the occupational pension scheme is financed. With regard to the financing, it is possible to distinguish between funded and unfunded schemes. Funded schemes prevail in China, India and Japan. Companies located in these countries make regular cash contributions to a pension fund, which collects the money and is responsible for the future pension payments to the employees. By contrast, in an unfunded scheme, which is popular in Singapore, the company takes such responsibility.

In both cases the costs for the future pension payments are deductible from the tax base upon realization. This is obvious from an economic point of view as the pension liability and premiums and the contributions to the book reserve express the same thing: the annual and accumulated pension costs. Hence, in the case of a funded scheme, the premiums paid to the pension fund are deductible; and in the case of an unfunded scheme, a company accounts for a pension reserve in the balance sheet and deducts annual contributions to this book reserve from the tax base.

A meaningful comparison of the tax effects of pension costs has to include both methods of financing future pensions and consider equivalent pension obligations as a starting point. Therefore, a defined benefit pension plan is accounted for in the benchmark case taking the projected final salary of each employee as a basis[20]. Since we assume an identical pension plan in each country, the total pension costs, which are deductible from the company's tax base over the professional life of an employee, do not differ between the countries. What may differ, nevertheless, are the average pension costs eligible for deduction in a certain period.

• **Taxation of dividends**

As far as domestic dividend is concerned, all countries adopt the exemption at the corporate level with different requirements. In both China and Singapore, 100% exemption is available if the dividends are received from another resident enterprise and regarded as franked since they have been subject to corporate income tax. Companies located in India can benefit from a 100% exemption of domestic dividend only if dividend distribution tax has been paid. In Japan, however, for shareholdings of less than 25%, or shareholdings of at least 25% but held for less than six months, 50% of the net amount of dividends received less interest expense is exempt from corporate income tax; for shareholdings of at least 25% held for six months or more, 100% of the net amount of dividends received less interest expense is exempt.[21]

Regarding foreign dividends, a 100% exemption is carried out in Singapore if relevant tax has been paid in the foreign jurisdiction where the corporate tax rate is at least 15%. For Japanese corporations, 95% of dividends received from a foreign company can be excluded from the tax base only if the Japanese corporation has held at least 25% of the outstanding shares for a continuous six months or more immediately before the dividend declaration date. The remaining two countries, China and India, implement the credit method for foreign

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[20] The model firm employs 1,105 people with an average age of 43 years. The retirement age is fixed at 65.

[21] In this article, it is assumed that at least 25% of the shares are held for more than 6 months. Therefore, exemption is applied to dividend income.

TABLE 5.   MOST IMPORTANT RULES FOR DETERMINATION OF TAXABLE INCOME IN THE CONSIDERED COUNTRIES

| Country | China | India | Japan | Singapore |
|---|---|---|---|---|
| Depreciation of buildings | | | | |
| - Office buildings | SL, 20 years | DB, 10% | SL, 50 years | − |
| - Factory buildings | SL, 20 years | DB, 10% | SL, 38 years | SL, 25 years Initial allowance: 25% |
| Depreciation of equipment | | | | |
| - Office equipment | SL, 5 years | DB, 10% | DB, 250% of the rate based on SL | SL, 3 years |
| - Factory equipment | SL, 10 years | DB, 10% | DB, 250% of the rate based on SL | SL, 3 years |
| Depreciation of machinery | SL, 10 years | DB, 15% Initial allowance: 20% | DB, 250% of the rate based on SL | SL, 3 years |
| Amortization of intangibles | SL,10 years | DB, 25% | SL, 8 years | SL, 5 years |
| Valuation of inventories | Weighted average | Weighted average | Fifo | Weighted average |
| Production costs | Manufacturing cost, Certain relevant administration cost | Manufacturing cost, Administration cost, Distribution cost | Only manufacturing expenditure | Only manufacturing expenditure |
| Pension costs | Pension fund | Pension fund | Pension fund | Pension provision |
| Deductible taxes | Real estate tax (urban land use tax/ house property tax) | Real estate tax | Local enterprise tax, Special local tax, Property tax, City planning tax, Business occupancy tax | Real estate tax |
| Dividend income | | | | |
| - Domestic dividend | Exemption (100%) | Exemption (100%) | Exemption (50% / 100%) | Exemption (100%) |
| - Foreign dividend | Credit | Credit | Exemption (95%) | Exemption (100%) |
| Treatment of losses | | | | |
| - Carry-forward | 5 years | 8 years | 7 years | unlimited |
| - Carry-back | − | − | [1 year] | 1 year |

*Note:* SL means straight-line method, DB means declining-balance method

dividends.

• **Treatment of losses**

Concerning the tax treatment of losses, only Singapore and Japan allow for a loss carry-back. Companies located in Singapore are entitled to a loss carry-back for one year, if losses are equal or less than 100, 000 SGD. In Japan a one-year carry-back is available only for corporations filling a blue return or companies with paid-in capital less than 100 million JPY. All countries, however, grant a loss carry-forward, which is limited to five consecutive years in China, eight in India and seven in Japan. Only Singapore permits an unlimited loss carry-

TABLE 6.   STANDARD RATES OF THE ENTERPRISE TAX IN JAPAN

| Taxable income (JPY) | Paid-in capital up to 100 million JPY | Paid-in capital exceeding 100 million JPY |
| --- | --- | --- |
| up to 4 million | 2.7 | 1.5 |
| 4 — 8 million | 4.0 | 2.2 |
| over 8 million | 5.3 | 2.9 |

forward.

## 2.   Other Taxes on Corporate Profits

In addition to corporate income tax, both India and Japan levy certain other taxes on corporate income. There is no comparable second or third tax on income in China or Singapore.

In India, a dividend distribution tax at a rate of 15% is imposed on distributed profits. In addition, a surcharge of 10% is levied when the corporate net income exceeds 10 million INR. Finally, an education cess of 3% (including surcharge) is charged in all cases. Dividends subject to dividend distribution tax are thus taxed at an effective statutory tax rate of up to 16.99% but exempt from tax in the hands of the recipient.

Besides corporate income tax, companies engaged in business with an office or place of business in Japan are subject to local enterprise tax as well as special local corporate tax. For companies with stated capital of more than 100 million JPY, local enterprise tax, imposed by the prefectures, is assessed on three components[22]: net taxable income, "Value Added" and share capital including capital surplus[23].

In general, local enterprise tax is imposed on net taxable income. The basis of assessment is similar to that for corporate income tax with adjustments mainly for foreign source income. Furthermore, a carry-back of losses is not allowed for the purpose of local enterprise tax. The standard tax rates for local enterprise tax on net taxable income are shown in Table 6.

The "Value Added" factor is taxed at a rate of 0.48%. The amount of "Value Added" is the sum of salaries and other remunerations, net interest expenses, net real property rental fee expenses and net profit or loss for the current years based on the local enterprise net taxable income. The added value is reduced by the amount of salaries and other remunerations exceeding 70% of the sum of salaries, other remunerations, net interest expense and net real property rental fees.

Local enterprise tax is fully deductible in computing taxable income for corporate income tax as well as for enterprise tax on the date when the corporation is liable to the tax.

In addition to local enterprise tax, corporate taxpayers in Japan are subject to the so called special local corporate tax, which is levied as a percentage of the amount of local enterprise tax due. The rate is 81% for companies with stated capital of less than 100 million JPY and 148% for companies with stated capital of more than 100 million JPY. Special local corporate tax is fully deductible in computing taxable income for corporate income tax.

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[22] Small corporations with stated capital of less than 100 million JPY are only subject to local enterprise tax on net taxable income at a rate of up to 5.4%.

[23] For local enterprise tax on capital see Section III.3.

### 3.  Non-profit Taxes

Besides corporate income tax and other taxes on profits, all countries in our sample levy certain non-profit taxes including real estate taxes. In addition, payroll taxes and/or net wealth taxes are imposed in India and Japan.

Companies located in China are charged two kinds of real estate tax, namely urban land use tax and house property tax. Urban land use tax is imposed on all entities owning land located in cities and towns. The tax rates vary between 0.6 CHY and 30 CHY per square meter[24] according to the size of the city and the quality of the land. House property tax is levied on property (houses and other buildings, but not land) by the local government authority of the city, town, county or municipality in which the property is situated. The tax rate is either 12% of the annual rental income or 1.2% of the assessed value of property[25]. The tax base is the original value, e.g. the annual rental income or the assessed value, minus a deduction ranging from 10% to 30% of that original value. Both, urban land use tax as well as house property tax, are deductible for the purpose of corporate income tax.

In India, corporations are, aside of corporate income and dividend distribution tax, subject to a state real estate tax. The states have been given the power to levy such tax on property situated within their boundaries. The law, therefore, varies from one state to another. In this paper, the state of Karnataka is taken as an example. The tax rate is 25% with a cess of 24%, resulting in an effective statutory rate of 31%. As for the tax base, the built-up area will first be multiplied by the rate specified for the zone in which the property is located[26]. The result is then multiplied by 10 to arrive at the gross annual value. After that, depreciation based on the age of the property at the prescribed percentage is deducted from the gross annual value so as to get the tax base, i.e. the net annual value of the real estate.

In addition to state real estate tax, corporations located in India are required to pay wealth tax of 1% on the aggregate value of specified assets, net of debts incurred in relation to those assets, exceeding 1.5 million INR. Specified assets mainly include certain types of landed property, boats, aircraft, motor cars and articles made of precious metals. According to the specific tax regulations, however, land situated in non-urban areas, commercial complexes and any building used for conducting a business are tax-exempt. Furthermore, Indian companies are subject to a fringe benefit tax at a rate of 30%. The tax is levied on the specified percentage of the value of benefits in kind provided to their employees.

All non-profit taxes, provided they are connected with the business and incurred in the course of business of the company, are deductible from the tax base of corporate income tax in India.

Due to several non-profit taxes, the structure of the tax system in Japan differs significantly from those of the other countries. Aside from three types of real estate tax (i.e. property tax, city planning tax and business occupancy tax, which is also levied on payroll), inhabitants tax on paid-up capital is levied in Japan. Moreover, Japanese companies are subject to local

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[24] It is assumed in this article that the average tax rate is 12 CHY per square meter, which is the average of the tax rates in main Chinese cities.

[25] It is supposed in this article that house property tax for the model firm is imposed on 1.2% of the assessed value of the property and the assessed value is arrived at by deducting 20% of the acquisition cost of the property.

[26] 30 INR per square foot is used in this paper.

TABLE 7.  STANDARD RATES OF JAPANESE INHABITANTS TAX ON CAPITAL

| Paid-up capital plus reserve funds in JPY | | Number of employees | Standard levy in JPY |
|---|---|---|---|
| More than 5 billion | prefectural | − − | 800.000 |
| | municipal | more than 50 | 3.000.000 |
| | | 50 or less | 410.000 |
| More than 1 billion but less than 5 billion | prefectural | − − | 540.000 |
| | municipal | more than 50 | 1.750.000 |
| | | 50 or less | 410.000 |
| More than 100 million but less than 1 billion | prefectural | − − | 130.000 |
| | municipal | more than 50 | 400.000 |
| | | 50 or less | 160.000 |
| More than 10 million but less than 100 million | prefectural | − − | 50.000 |
| | municipal | more than 50 | 150.000 |
| | | 50 or less | 130.000 |
| Not more than 10 million | prefectural | − − | 20.000 |
| | municipal | more than 50 | 120.000 |
| | | 50 or less | 50.000 |

enterprise tax on capital if their stated capital exceeds 100 million JPY.

Property tax is a municipal tax imposed on land, buildings and depreciable business assets (other than automobiles and light vehicles). In principle, the market prices of land and buildings constitute the tax base for such assets. In practice, however, the value registered on the tax cadaster is used for the taxation of land and buildings. Depreciable business assets other than buildings are assessed on the taxpayer's reported net book value. The standard tax rate of property tax is 1.4%.

City planning tax, a municipal levy which may be imposed by cities, towns, and villages undertaking projects under the City Planning Law, is imposed on the owners of land and buildings located within the urban promotion area. The appraised value for property tax purposes is used as the tax base for the city planning tax. The maximum city planning tax rate is 0.3%.

Business occupancy tax, a municipal tax on business activity in an office building, is partly based on the amount of utilized floor space and only imposed if the floor area amounts to more than 1,000 square meters. The tax rate is 600 JPY per square meter. Furthermore, business occupancy tax includes a tax on payroll. If the number of employees exceeds 100, total payroll is taxed at a rate of 0.25%.

Companies with paid-in capital exceeding 100 million JPY are also subject to a size-based business tax, meaning that local enterprise tax is also levied on the total amount of stated capital and capital surplus of the corporation as of the end of the fiscal year. The standard tax rate for the capital amount is 0.2%.

In addition to local enterprise tax on capital, inhabitants tax is imposed by prefectures and municipalities on paid-up capital plus capital reserves. The applicable prefectural levies are shown in Table 7. In the same manner, the municipal levy depends on the paid-up capital plus reserve funds and the number of employees as shown in Table 7.

In Singapore, real estate tax is levied at 10% on the annual value of all immovable

property, including houses, buildings, land and tenements. The annual value, i.e. the tax base, is determined by using the rental comparison method, the contractor's test method or the profit method. The rental comparison method, the most commonly used method of valuation, is employed in this article and the rent of the property is assumed to be 5% of the acquisition costs.

## IV.  *Comparison of the Effective Average Tax Burden at the Corporate Level*

The purpose of this section is to provide a detailed analysis of the effective average tax burdens of the four considered Asian countries. At first, the effective average tax burdens are analyzed for the benchmark case and the influence of the main tax drivers, i.e. the different taxes, the tax rates and aspects of the tax base, are pointed out. To widen the spectrum of the analysis, additional calculations of the effective average tax burden under different assumptions concerning the model firm's profitability, capital intensity, labor intensity and financing policy are made. Nevertheless, it has to be kept in mind that the base case results are valid only for the model firm characterized by the specific set of financial ratios given in Tables 2 and 3. Corporate taxes might, however, affect investments in different industry sectors differently. To address these issues, check the robustness of our results and examine the effects of altering model assumptions, thereby illustrating the sensitivity of the results to selected financial ratios, the comparison of the effective average tax burdens is extended to corporations characterized by specific sets of financial ratios representing different industries. The considered industries are energy, commerce, construction, manufacturing and transport.

### 1.  Overview of the Results

The effective tax burdens of the benchmark case are displayed in Table 8. The results show that there is a remarkable dispersion of the effective tax burdens over the ten-year period across the considered countries. The tax burdens range from 42.90 million EUR in India to 17.05 million EUR in Singapore. In other words, the tax burden of a corporation in India is 151.61% higher than that of an identical corporation located in Singapore. One reason for the dispersion is the different tax rates on corporate income in the four considered countries. As demonstrated in Section III.1 (1) the statutory tax rates including surcharges vary between 35.19% in Japan and 18% in Singapore. By comparing the statutory tax rates and the effective average tax burdens it turns out that both indicators are closely correlated, which is not surprising as the effective tax burden is calculated for a highly profitable model firm in the benchmark case.

TABLE 8.   COMPARISON OF THE EFFECTIVE TAX BURDEN (TEN PERIODS)

| Country | China | India | Japan | Singapore |
|---|---|---|---|---|
| Effective tax burden in million EUR | 26.08 | 42.90 | 42.31 | 17.05 |
| Ranking | 2 | 4 | 3 | 1 |

TABLE 9.    IMPACT OF VARIOUS TAX CATEGORIES ON THE EFFECTIVE TAX BURDEN

| Country | China | India | Japan | Singapore |
|---|---|---|---|---|
| Profit taxes | 93.91% | 98.40% | 89.43% | 95.52% |
|   Corporate income tax | 93.91% | 67.70% | 65.89% | 95.52% |
|   Surcharge on corporate income tax *(Inhabitants tax on income)* | – | 6.41% | 10.99% | – |
|   Education cess | – | 2.10% | – | – |
|   Enterprise tax on income | – | – | 3.83% | – |
|   Enterprise tax on "Value Added" | – | – | 3.08% | – |
|   Special local tax on income | – | – | 5.64% | – |
|   Dividend distribution tax | – | 22.19% | – | – |
| Real estate taxes | 6.09% | 1.60% | 1.03% | 4.48% |
|   Business office tax on floor space | – | – | 0.23% | – |
|   City planning tax | – | – | 0.80% | – |
|   House property tax | 3.02% | – | – | – |
|   Land use tax | 3.07% | – | – | – |
| Other non-profit taxes | – – | – – | 9.54% | – – |
|   Business office tax on payroll | – | – | 1.19% | – |
|   Enterprise tax on capital | – | – | 0.56% | – |
|   Inhabitants tax on capital | – | – | 0.46% | – |
|   Property tax | – | – | 7.33% | – |

## 2.    Impact of Different Taxes on the Effective Tax Burden

A second reason is the various tax systems, which highly differ in the imposed taxes. Table 9 shows the share of each tax in the tax burden for the four considered countries and reveals the differences in the structure of the tax systems. The corporate income tax constitutes the main share in the overall tax burdens in all countries. Its share ranges from 95.52% in Singapore to 65.89% in Japan. In India and Japan, however, as they both levy surcharges on the corporate income tax as well as other taxes on corporate income, the overall share of profit taxes in the total tax burden amounts to 98.40% and 89.43% in respectively.

Regarding India, its overall tax burden, which is the highest of the four countries, is not only a result of the high corporate income tax rate of 33.99% including surcharges and education cess. It is rather due to the profit distribution tax, which is levied on distributed profits at a statutory rate of 15% leading to an effective tax burden of 9.52 million EUR (equals 22.19% of the overall effective tax burden). In addition, the application of a full cost approach as well as considerable low depreciation allowances for machinery and equipment broaden the tax base for corporate income tax and yield a significant additional tax burden for Indian corporations. Non-profit taxes, however, have only a minor impact on the overall tax burden. Their share in the overall tax burden only amounts to 1.60%.

The second highest tax burden in the country ranking with 42.31 million EUR is in Japan. First, this rank is mainly due to the high corporate income tax rate of 35.19% including inhabitants tax on income. Second, the wide variety of other taxes imposed on corporate income, namely enterprise tax and special local income tax, results in an additional tax burden of 5.31 million EUR (equals 12.55% of the overall effective tax burden). Furthermore, the Japanese tax system is characterized by a significant capital tax burden. In total, Japan imposes non-profit taxes amounting to 4.47 million EUR (equals 10.57% of the overall effective tax

burden), while in all other countries the tax burden on non-profit taxes ranges only from 0.69 million EUR or 1.60% (India) to 1.59 million EUR or 6.09% of the overall tax burden (China).

In contrast, the second lowest tax burden of 26.08 million EUR in China is the result of a simple tax system, under which only house property tax and land use tax are levied in addition to corporate income tax. The latter accounts for a share of 93.91% of the overall tax burden and amounts to 24.49 million EUR. The relatively low corporate income tax burden is mainly due to the low corporate income tax rate of 25%. A more favorable position in the country ranking is, however, prevented by comparably restrictive regulations governing the corporate income tax base. Despite the unfavorable depreciation allowances with low depreciation rates for factory equipment, machinery and intangible assets, the application of a full cost approach increases the corporate income tax burden. In addition, the impact of real estate taxes on the overall tax burden is comparatively high. Their share in the overall tax burden amounts to 6.09%, which is the highest tax burden on real estate in all considered territories.

The lowest tax burden of the four countries amounting to 17.05 million EUR is in Singapore. This is, however, not only the result of the lowest corporate income tax rate of 18%, but also due to favorable allowance in the tax base. Although capital allowances are not granted for office buildings, depreciation allowances can, in general, be deemed comparably generous. Namely the initial allowance of 25% for industry buildings as well as the comparably short statutory useful lifes over which equipment and machineries are depreciated lead to very high depreciation allowance in early periods thus generating positive liquidity and interest effects. Furthermore, non-profit taxes are of little importance, as Singapore only imposes a real estate tax, which amounts to 0.76 million EUR or 4.48% of the overall effective tax burden.

The comparison of the effective average tax burdens in China, India, Japan and Singapore reveals significant differences of 25.85 million EUR in total between the lowest (i.e. Singapore) and the highest (i.e. India) tax burden in the four considered countries. As shown above, these differences cannot be traced back to a single feature of the tax system. Nonetheless, the results of the benchmark case indicate that the overall tax burdens are mainly driven by the corporate income tax. Primarily, the statutory corporate income tax rate has a significant influence on the effective tax burden. Furthermore, the different tax structures of the considered countries are of high relevance for the determined country ranking. Especially the Japanese tax system reveals a high proportion of non-profit taxes. More than 10% of the tax burden in Japan is the result of taxing payroll, property and real estate. In contrast, less than 2% of the tax burden in India is due to capital-related taxes.

## 3.  Sensitivity Analysis

The results presented in Section IV.2 are valid for an EU-27 average model firm characterized by the specific financial ratios presented in Table 3. These results represent the benchmark case. Other results are likely to be observed for a different set of corporate and economic data. Thus, further analysis is required to verify the above findings. In a first step, the effects of an isolated variation of the profitability, the capital and labor intensity and the equity ratio of the model-firm are determined. Then the comparison of the effective average tax burdens is extended to corporations characterized by specific sets of financial ratios representing business sectors other than that of the benchmark case.

TABLE 10.    EFFECTIVE TAX BURDEN FOR DIFFERENT LEVELS OF PROFITABILITY
IN MILLION EUR (TEN PERIODS)

| | Effective tax burden for different levels of profitability | | | | | | |
| | −30% (1.81%) | −20% (2.07%) | −10% (2.33%) | Benchmark case (2.59%) | +10% (2.85%) | +20% (3.11%) | +30% (3.37%) |
| Country | EUR (million) Deviation from benchmark case (%) [Ranking] | EUR (million) Deviation from benchmark case (%) [Ranking] | EUR (million) Deviation from benchmark case (%) [Ranking] | EUR (million) Deviation from benchmark case (%) [Ranking] | EUR (million) Deviation from benchmark case (%) [Ranking] | EUR (million) Deviation from benchmark case (%) [Ranking] | EUR (million) Deviation from benchmark case (%) [Ranking] |
|---|---|---|---|---|---|---|---|
| China | 21.38 (−18.09%) [2] | 22.94 (−12.04%) [2] | 24.45 (−6.24%) [2] | 26.08 [2] | 27.77 (6.50%) [2] | 29.33 (12.39%) [2] | 30.97 (18.75%) [2] |
| India | 34.63 (−19.28%) [4] | 37.46 (12.70%) [4] | 40.08 (−6.58%) [4] | 42.90 [4] | 45.85 (6.86%) [4] | 48.51 (13.07%) [4] | 51.39 (19.77%) [4] |
| Japan | 34.50 (−18.47%) [3] | 37.20 (−12.07%) [3] | 39.69 (−6.20%) [3] | 42.31 [3] | 45.01 (6.38%) [3] | 47.42 (12.08%) [3] | 50.02 (18.23%) [3] |
| Singapore | 13.11 (−23.10%) [1] | 14.48 (−15.10%) [1] | 15.75 (−7.67%) [1] | 17.05 [1] | 18.54 (8.72%) [1] | 19.79 (16.02%) [1] | 20.99 (23.08%) [1] |

(1) Profitability

In order to measure the impact of the model firm's profitability on the effective average tax burden, the tax burdens of the four countries are recalculated by gradually increasing or decreasing the financial ratio return on sales, as major indicator for the firm's profitability, in sequences of 10% compared to the benchmark case. As the expenses are hold stable, a rise in sales revenues results in an increase of taxable profits and liquidity. The effective average tax burden is thus increasing with the value for the return on sales and vice versa.

The results displayed in Table 10 show that these general findings are valid for all four considered countries; however, in relative and absolute terms the increases (decreases) of the effective tax burden are highly different. In Japan, which levies various non-profit taxes, and China, which has comparatively disadvantageous depreciation allowances, the relative reduction of the effective tax burden is lower compared to the other countries. This is due to the impact of non-profit taxes and disadvantageous depreciation allowance becoming more important with decreasing profitability and vice versa. This result can be illustrated by comparing two identical investments, which differ only in profitability: In the case of the investment with the higher profitability, having, however, the same level of expenses as the other investment, the receipts exceed the expenses by a higher amount. Thus, the treatment of expenses, e.g. the path of tax depreciation allowances, is of less importance. The additional income is, in fact, taxed at the statutory tax rate and the relative importance of non-profit taxes or disadvantageous depreciation allowance is thus decreasing with increasing profitability. Consequently, the most fluctuating effective tax burden can be observed in Singapore, where the proportion of non-

TABLE 11.   EFFECTIVE TAX BURDEN FOR DIFFERENT LEVELS OF CAPITAL INTENSITY IN MILLION EUR (TEN PERIODS)

| | Effective tax burden for different levels of capital intensity | | | | | | |
|---|---|---|---|---|---|---|---|
| | −7.50% (27.64 %) | −5.00% (28.40%) | −2.50% (29.14%) | Benchmark case (29.89%) | +2.50% (30.64%) | +5.00% (31.38%) | +7.50% (32.13%) |
| Country | EUR (million) *Deviation from benchmark case (%)* [Ranking] | EUR (million) *Deviation from benchmark case (%)* [Ranking] | EUR (million) *Deviation from benchmark case (%)* [Ranking] | EUR (million) *Deviation from benchmark case (%)* [Ranking] | EUR (million) *Deviation from benchmark case (%)* [Ranking] | EUR (million) *Deviation from benchmark case (%)* [Ranking] | EUR (million) *Deviation from benchmark case (%)* [Ranking] |
| China | 27.08 (3.84%) [2] | 26.74 (2.53%) [2] | 26.41 (1.29%) [2] | 26.08 [2] | 25.75 (−1.25%) [2] | 25.43 (−2.48%) [2] | 25.11 (−3.72%) [2] |
| India | 44.82 (4.46%) [4] | 44.16 (2.94%) [4] | 43.55 (1.50%) [4] | 42.90 [4] | 42.28 (−1.45%) [4] | 41.67 (−2.88%) [4] | 41.05 (−4.32%) [4] |
| Japan | 43.88 (3.71%) [3] | 43.36 (2.47%) [3] | 42.86 (1.31%) [3] | 42.31 [3] | 41.77 (−1.27%) [3] | 41.23 (−2.55%) [3] | 40.68 (−3.86%) [3] |
| Singapore | 18.25 (7.00%) [1] | 17.88 (4.85%) [1] | 17.49 (2.55%) [1] | 17.05 [1] | 16.71 (−2.01%) [1] | 16.35 (−4.10%) [1] | 15.98 (−6.32%) [1] |

profit taxes in the total tax burden is low and generous depreciation allowances are generally offered.

Nevertheless, the ranking of the four countries remains constant (see Table 10). Singapore ranks lowest in all cases followed by China. Both countries offer significantly lower tax burdens than Japan and India. Due to the share of non-profit taxes in Japan the effective tax burdens of India and Japan converge with a decreasing level of profitability.

(2) Capital intensity

The aim of this section is to capture the impact of the structure of asset on the effective average tax burden. In doing so, the assumptions concerning the capital intensity of the model firm are changed by raising or reducing the share of tangible assets in total assets by up to 7.50%. In order to keep the total balance sheet constant, the value of the long term debts and investments are reduced (increased) accordingly. Moreover, the sales as well as the interest expenditures are kept constant to maintain an unchanged level of profitability.

The results in Table 11 show that, due to a shift from non depreciable assets (long term debts) to depreciable tangible assets, the effective tax burdens in all four considered countries are decreasing with the capital intensity and vice versa. The highest relative decrease with 6.32% can be observed for corporations located in Singapore and is attributable to the generous depreciation rules. In contrast, the lowest fluctuation is in China, which is again mainly due to the restrictive depreciation rules. In Japan, land as well as all depreciable tangible fixed assets are, in contrast to financial assets, subject to real property tax. The increasing portion of the real property tax in the overall tax burden thus mitigates the effects of the generous

TABLE 12.   EFFECTIVE TAX BURDEN FOR DIFFERENT LEVELS OF LABOR INTENSITY
IN MILLION EUR (TEN PERIODS)

| Country | Effective tax burden for different levels of labor intensity | | | | |
|---|---|---|---|---|---|
| | −20% (16.78%) EUR (million) *Deviation from benchmark case (%)* [Ranking] | −10% (18.87%) EUR (million) *Deviation from benchmark case (%)* [Ranking] | Benchmark case (20.97%) EUR (million) *Deviation from benchmark case (%)* [Ranking] | +10% (23.07%) EUR (million) *Deviation from benchmark case (%)* [Ranking] | +20% (25.16%) EUR (million) *Deviation from benchmark case (%)* [Ranking] |
| China | 26.18 (0.40%) [2] | 26.13 (0.23%) [2] | 26.08 [2] | 26.01 (−0.25%) [2] | 25.94 (−0.51%) [2] |
| India | 43.06 (0.35%) [4] | 42.99 (0.20%) [4] | 42.90 [4] | 42.81 (−0.23%) [4] | 42.71 (−0.46%) [4] |
| Japan | 42.25 (−0.13%) [3] | 42.28 (−0.06%) [3] | 42.31 [3] | 42.34 (0.07%) [3] | 42.35 (0.10%) [3] |
| Singapore | 17.25 (1.18%) [1] | 17.17 (0.66%) [1] | 17.05 [1] | 16.93 (−0.73%) [1] | 16.88 (−1.04%) [1] |

depreciation allowances and yields the second lowest reduction of 3.86%. The levy of non-profit taxes or more precisely the absence of financial assets in the tax base therefore disadvantages capital intensive production. Due to the fact that the change in the effective tax burdens are only minor, the country ranking is, however, unaffected by the variation of the capital intensity.

(3) Labor intensity

The impact of the model firm's labor intensity on the effective tax burden is analyzed by raising (reducing) the ratio of personnel expenditure to turnover in sequences of 10% compared to the benchmark case. Moreover, the rise (decrease) in wages and salaries is counterbalanced by a reduction (increase) of other expenses, so that the profitability maintains constant.

The results displayed in Table 12 show that the effective tax burden is, with exception of Japan, decreasing with labor intensity. The reason for the observed increase of the effective tax burden is the inclusion of personal expenditure and pension costs in the production costs and hence the postponement of their deductibility to the period in which the underlying products are sold. In the case of Japan, these effects are, however, overcompensated by the effects of the business office tax on payroll and the taxation of salaries within the enterprise tax on the "Value Added" . Therefore, the Japanese effective tax burden is, contrarily to all other considered countries, increasing with labor intensity and vice versa. Even so, as the changes of the effective tax burdens are only minor, the country ranking remains constant.

(4) Structure of finance

In this section, the impact of different financing policies on the average tax burden is

TABLE 13.   EFFECTIVE TAX BURDEN FOR DIFFERENT EQUITY RATIOS IN
MILLION EUR (TEN PERIODS)

| Country | Effective tax burden for different equity ratios | | | | |
|---|---|---|---|---|---|
| | −30%<br>(24.04%)<br><br>EUR (million)<br>*Deviation from*<br>*benchmark case (%)*<br>[Ranking] | −10%<br>(30.91%)<br><br>EUR (million)<br>*Deviation from*<br>*benchmark case (%)*<br>[Ranking] | Benchmark case<br>(34.34%)<br><br>EUR (million)<br>*Deviation from*<br>*benchmark case (%)*<br>[Ranking] | +10%<br>(37.77%)<br><br>EUR (million)<br>*Deviation from*<br>*benchmark case (%)*<br>[Ranking] | +30%<br>(44.64%)<br><br>EUR (million)<br>*Deviation from*<br>*benchmark case (%)*<br>[Ranking] |
| China | 24.31<br>(−6.79%)<br>[2] | 25.48<br>(−2.29%)<br>[2] | 26.08<br><br>[2] | 26.68<br>(2.33%)<br>[2] | 27.92<br>(4.65%)<br>[2] |
| India | 39.84<br>(−7.13%)<br>[4] | 41.87<br>(−2.41%)<br>[4] | 42.90<br><br>[4] | 43.95<br>(2.45%)<br>[4] | 46.10<br>(4.88%)<br>[4] |
| Japan | 39.33<br>(−7.05%)<br>[3] | 41.31<br>(−2.36%)<br>[3] | 42.31<br><br>[3] | 43.23<br>(2.40%)<br>[3] | 45.38<br>(4.74%)<br>[3] |
| Singapore | 15.61<br>(−8.46%)<br>[1] | 16.54<br>(−3.02%)<br>[1] | 17.05<br><br>[1] | 17.60<br>(3.18%)<br>[1] | 18.68<br>(6.16%)<br>[1] |

analyzed. In order to do so, the sources of financing are gradually changed by increasing (decreasing) the equity to total capital ratio by up to 30%. The stated capital is substituted by long term debt and vice versa, so that total interest expenses are also increasing with a decrease in the equity to total capital ratio.

Since interest expenses are completely deductible from the taxable profits in all four considered countries, the effective tax burdens are increasing with the equity to total capital ratio. As Table 13 shows, this result holds true for all considered countries. Debt financing of an investment can therefore be seen as privileged compared to equity financing. While interest expenses are deductible from taxable profits, dividends must be paid out of taxed profits. Thus, none of the considered tax systems are neutral towards the source of finance.

Since all four countries generally allow a full deduction of interest expenses for corporate income tax purposes, the differences in the effective tax burdens between the countries remain stable. Additional effects can, however, be observed in Japan, where enterprise tax on "Value Added" is levied on net interest expenses. Furthermore, the discrimination of equity financing is intensified by the levy of enterprise tax on capital which does not treat the payments for debt and equity equally. Overall, the dissimilarities in the relative changes of the effective tax burden between the countries must, however, mainly be traced back to the effects of the corporate income tax. Therefore, the results are similar to the one already observed when the model firm's profitability was changed (see section IV.3(1)). The country ranking remains stable.

(5) Specific sectors

The above findings illustrate that the effective average tax burdens depend on the capital intensity, the sources of finance, the personal intensity and the profitability of the underlying

TABLE 14.   FINANCIAL RATIOS OF SECTOR-SPECIFIC MODEL FIRMS (PERIOD SIX)

| Financial ratios | Bench-mark case | Commerce | Con-struction | Energy | Manu-facturing | Service | Transport |
|---|---|---|---|---|---|---|---|
| Profit / loss for period (in thousands EUR) | 4,125 | 4,100 | 2,589 | 14,039 | 5,088 | 2,570 | 992 |
| Share of tangible fixed assets | 29.89% | 22.37% | 19.03% | 42.85% | 33.66% | 25.16% | 40.51% |
| Return on turnover | 2.59% | 1.74% | 2.58% | 4.74% | 3.01% | 2.50% | 0.69% |
| Return on equity | 10.50% | 15.94% | 10.96% | 7.07% | 8.77% | 8.64% | 1.85% |
| Equity ratio | 34.34% | 28.00% | 28.44% | 41.87% | 39.75% | 31.24% | 33.79% |
| Return on assets | 6.19% | 6.32% | 4.75% | 5.62% | 5.95% | 4.68% | 3.46% |
| Inventories to capital | 18.14% | 26.66% | 18.11% | 5.10% | 19.20% | 6.20% | 4.14% |
| Costs for personnel to turnover | 20.97% | 11.76% | 22.78% | 11.51% | 20.93% | 43.94% | 28.32% |

corporation. In order to enlarge the spectrum of the analysis, companies belonging to different business sectors are analyzed in isolation. The considered sectors are commerce, construction, energy, manufacturing, service and transport. The companies representing these sectors are characterized by a specific set of financial ratios, displayed in Table 14.[27] Again, it has to be kept in mind that these financial ratios are derived from a European data set and might, therefore, be different from actual situations in each sector for the considered Asian countries. Nevertheless, the use of sector specific EU-27 pre-tax data is necessary for a comparison with the effective tax burdens in the EU Member States, which were and will be calculated based on the same set of assumptions. In addition, as the sector analysis considers a simultaneous variation of the financial ratios of the benchmark case, it is important for checking the robustness of our results and examining the effects of altering model assumptions, thereby illustrating the sensitivity of the results to a simultaneous variation of selected financial ratios.[28]

At first sight, the industry comparison confirms the result of the benchmark case (Table 15). It reveals that different corporate economic data can indeed effect variations in the tax burden differences between the four considered countries. The relative tax burden differences as well as the country ranking remain, however, almost the same. In particular, this result holds true for the business sectors commerce, construction and manufacturing. Nevertheless, considering the effective tax burdens in the sectors energy, service and transport, it is obvious that the results of the benchmark case are not universally applicable under all circumstances.

According to the results displayed in Table 15, Japan and India switch their position in the country ranking in the business sectors energy, service and transport. In contrast to the benchmark case, the company in the transport sector is characterized by a very low profitability and a high share of tangible fixed assets. Thus, as non-profit taxes become more important, Japan (21.44 million EUR) degrades its relative position compared to the other countries and falls far behind the effective tax burden of India (14.12 million EUR). In other words, the tax

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[27] This data is again taken from the AMADEUS database (Bureau van Dijk Electronic Publishing (http://www.bvdep.com/de/AMADEUS.html)). See FN 12.

[28] Although different tax measures or incentives may apply to special types of activities or industry segments in all four considered countries, the sector-specific tax burdens are computed under the rules described in section III. This is mainly a matter of comparison of the results in the four considered countries, as the requirements to qualify for these special tax regimes are strongly different.

TABLE 15.   EFFECTIVE TAX BURDEN FOR DIFFERENT SECTORS (TEN PERIODS)

| Country | | China | India | Japan | Singapore |
|---|---|---|---|---|---|
| Benchmark Case | Tax burden in EUR (million) | 26.08 | 42.90 | 42.31 | 17.05 |
| | [Rank] | [2] | [4] | [3] | [1] |
| Commerce | Tax burden in EUR (million) | 24.33 | 40.88 | 39.15 | 16.61 |
| | [Rank] | [2] | [4] | [3] | [1] |
| Construction | Tax burden in EUR (million) | 15.63 | 26.33 | 25.49 | 10.35 |
| | [Rank] | [2] | [4] | [3] | [1] |
| Energy | Tax burden in EUR (million) | 83.22 | 115.01 | 124.76 | 48.31 |
| | [Rank] | [2] | [3] | [4] | [1] |
| Manufacturing | Tax burden in EUR (million) | 35.27 | 56.77 | 56.09 | 22.48 |
| | [Rank] | [2] | [4] | [3] | [1] |
| Service | Tax burden in EUR (million) | 14.57 | 23.71 | 25.23 | 9.70 |
| | [Rank] | [2] | [3] | [4] | [1] |
| Transport | Tax burden in EUR (million) | 13.36 | 14.12 | 21.44 | 5.36 |
| | [Rank] | [2] | [3] | [4] | [1] |

burden in the business sector transport is 51.84% higher in Japan than that of an identical corporation in India. Due to disadvantageous depreciation allowance, this result holds also true for China, whose effective tax burden in the transport sector (13.36 million EUR) is almost as high as the one in India.

Although the profitability and capital intensity in the sector service is comparable with the benchmark case, the relative position of Japan toward the other three countries is deteriorating. With an effective tax burden of 25.23 million EUR, Japan even falls behind India in the country ranking. The reason for the high tax burden for service corporations in Japan is the high labor intensity of 43.94% (costs for personnel to turnover) in contrast to 20.97% in the benchmark case. As a result, the tax burden of the business tax on payroll tax and the enterprise tax on "Value Added" becomes a more important factor in the overall tax burden.

Even though the company representing the energy sector is characterized by a high profitability, Japan ranks fourth and last in the country comparison. In fact, this is due to the comparably high capital intensity of the energy company. The Japanese advantages of the high profitability are overcompensated by the effects of the high capital intensity leading to a significant increase in the non-profit tax burden.

## V.   Summary

The taxation framework for investment in Asia varies significantly by territory. The qualitative comparison of the corporate tax regimes in China, India, Japan and Singapore reveals differences not only in the types of profit and non-profit taxation, but also in the tax system, tax bases and above all in corporate tax rates ranging from 18% in Singapore to 35.19% in Japan. As regards the definition of the tax base, the analysis also revealed some country specific peculiarities: Depreciation allowances, for example, are quite generous in Singapore and restrictive in China. Moreover, corporations located in China face restrictive loss-offsetting rules while Singapore and Japan offer not only a more generous loss carry-forward, but also allow for a carry-back of losses. In addition, Japan stands out with an ascertainment of several profit and non-profit taxes in addition to corporate income tax. Specific

regimes, such as tax facilities for SME investment or other tax incentives, are beyond the scope of the analysis. A detailed analysis of sector specific tax measures is also not taken into account.

The qualitative comparison of the tax regimes, however, cannot identify whether for example favorable allowances in the tax base compensate for higher tax rates or additional profit or non-profit taxes and vice versa. A comparison of the effective average tax burdens of corporations in the four considered countries based on the well known methodology of the European Tax Analyzer has, therefore, been carried out. The results of the quantitative analysis show remarkable dispersions of effective tax burdens between the countries covered in this study. Overall, the effective average tax burdens for the implemented EU-27 average model firm differ by approximately 60% between India (42.90 million EUR) and Singapore (17.05 million EUR). The base case results show that statutory tax rates and effective tax burdens are closely correlated. Consequently, the highest overall tax burden in the base case scenario can be found in India and Japan. Regarding the tax mix, the corporate income tax constitutes the main share in the overall tax burdens in all considered countries. Its share ranges from 95.52% in Singapore to 65.89% in Japan. The latter can be characterized by a high level of other profit and non-profit taxes beside corporate income taxes, which yield the second highest overall tax burden of 42.31 million EUR in Japan. Mainly due to comparably low corporate income tax rates and their simple tax systems, significantly lower tax burdens are imposed in China (26.08 million EUR) and Singapore.

Separate analysis under alternative assumptions concerning the profitability, the kind of investment, financing and the personnel intensity revealed that the relative and absolute differences in the effective tax burden between the considered countries strongly depend on the economic structure of the underlying companies. In particular, the levies of various non-profit taxes in Japan and restrictive depreciation allowances in China have an unfavorable effect on the tax burden of corporation when facing comparably high capital intensity or low profitability. These special characteristics of the different tax systems also break the correlation between the country ranking and statutory rates and mainly drive the changes in the country ranking if the tax burdens in different industry sectors are considered. The industry-specific analysis, which may be interpreted as a simultaneous variation of selected financial ratios, reveals the considerable variation of the average effective tax burden across economic activities. It confirms that different corporate economic data yields changes in the tax burden between the four considered countries. The comparison, however, also arrives at the result that the country ranking remains almost unchanged over all considered industries. According to this ranking, the Singaporean tax burden is by far the lowest in all considered cases, followed by China. Japan ranks second lowest ahead of India for most business sectors. Due to the high proportion of non-profit taxes in the overall tax burden, Japan falls behind India in sectors with a low profitability and/or a high capital and labor intensity, such as the transport, service and energy sectors. In order to ensure comparability across countries, however, an analysis of sector specific tax systems, which are applicable to certain sectors in Japan, for example, is not taken into account.

## REFERENCES

Bond, S.R., M.P. Devereux and M.J. Gammie (1996), "Tax Reform to Promote Investment," *Oxford Review of Economic Policy* 12, pp. 109-112.

Devereux, M.P. and R. Griffith (1998), " Taxes and the Location of Production: Evidence from a Panel of US Multinationals," *Journal of Public Economics* 68, pp.335-367.

Devereux, M.P. and R. Griffith (2003), "Evaluating Tax Policy for Location Decisions," *International Tax and Public Finance* 10, pp. 107-126.

Endres, D., C. Fuest and C. Spengel (2010), "Company Taxation in the Asia-Pacific Region, India, and Russia," Heidelberg, pp. 15-18.

Gutekunst, G. (2005), "Steuerbelastungen und Steuerwirkungen bei nationaler und grenzübers-chreitender Geschäftstätigkeit" [Tax Burdens and Tax Effects in National and Cross-border Business], Lohmar.

Jacobs, O.H. and C. Spengel (1996), "European Tax Analyzer," Baden-Baden.

Jacobs, O.H. and C. Spengel (2000), "Measurement and Development of the Effective Tax Burden of Companies an Overview and International Comparison," *Intertax* 28, pp. 334-351.

King, M.A. and D. Fullerton (1984), "The Taxation of Income from Capital," Chicago.

Meyer, R. (1996), "Computergestützte Simulation von Steuerbelastungen" [Computer-simulation of Tax Burdens], Baden-Baden.

OECD(1991), "Taxing Profits in a Global Economy, an Emerging Global Issue," Paris.

Oestreicher, A., C. Spengel and T. Reister (2009), "Common Corporate Tax Base and Effective Tax Burdens in the EU Member States," *World Tax Journal published by the International Bureau of Fiscal Documentation (IBFD)* , pp. 46-66.

Spengel, C.(1995), "Europäische Steuerbelastungsvergleiche" [Comparisons of Tax Burdens in Europe], Düsseldorf.

Stetter, T. (2005), "Computergestützte internationale Steuerbelastungsvergleiche" [Computer-based Comparisons of International Tax Burden], Lohmar.

Stetter, T. and C. Spengel (2006), "Taxation of Corporations in Canada: A comparison of Tax Burdens with the United States and Selected Member States of the European Union Using the European Tax Analyzer — Part 2," *European Taxation published by the International Bureau of Fiscal Documentation (IBFD)*, pp. 364-365.