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*Is Europe One Market?*

*A Transfer Pricing Economic Analysis of Pan-*

*European Comparables Sets*

Deloitte White Paper

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**Background document**

## Is Europe One Market?

### *A Transfer Pricing Economic Analysis of Pan-European Comparables Sets*

#### Deloitte White Paper

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## Executive Summary

- This White Paper presents original Deloitte & Touche research analyzing the issue whether pan-European comparables sets provide statistically different arm's length ranges of results compared to an arm's length range of results formed by European country-specific comparable companies.
- Our approach is scientific in that we use widely accepted statistical methods in our analysis. We generate arm's length ranges of comparable companies for our statistical tests using OECD transfer pricing principles, conservative assumptions, and sensitivity analysis to test the reasonableness of these assumptions. We describe our approach, assumptions, and statistical tests in detail in this report.
- As a prelude to the statistical analysis, we briefly review whether the critical legal factors that allow undistorted economic activities between the European states' markets are already in place, so that it is reasonable for us to test whether Europe is an integrated market for transfer pricing purposes. Further, we review economic studies that test the results of these EU initiatives as to whether EU product and financial markets have converged in prices, intra-EU trade, profits, etc. The legal evidence demonstrates that the most significant market impediments among EU member states have been abolished, and that the foundation for a highly integrated European market is already in place. The economic evidence indicates that European markets are integrating (or have integrated) and that in many ways the levels of price or profit differences among European countries are not meaningfully different from the differences found in integrated markets, such as Japan or the United States.
- Our statistical analysis comprises two separate series of tests covering 9 industries in 16 European countries (the EU states plus Norway). In the first series of tests, a detailed comparability analysis is performed to develop pan-European and country-specific arm's length ranges based on common OECD transfer pricing comparability analysis practice. The second series of tests takes a broader view of

comparability, in that the arm's length ranges are calculated from companies identified as comparable based principally on industry classification codes.

- The results of our statistical analysis under both series of tests clearly show that European arm's length ranges do not statistically differ from country-specific arm's length ranges in almost all cases. Specifically, out of the 234 tests conducted testing the statistical equality of upper and lower quartiles of arm's length ranges using 95 percent confidence intervals, 219 tests (approximately 94 percent of the tests) generate results supporting the equality of interquartile ranges. In other words, it is highly likely that a country-specific comparability analysis and a pan-European comparability analysis would result in interquartile arm's length ranges of results that were not statistically different at a 95 percent level of confidence.
- Further, when the country-specific arm's length range was statistically different from the pan-European arm's length range, there was no obvious bias or pattern of profit levels indicating that a particular European country's arm's length range of results is always statistically different from the rest of Europe.
- Pan-European comparability analysis may not be appropriate in all situations; the specific facts and circumstances in each case should be assessed in making this determination. However, our results clearly indicate that pan-European comparability searches do produce reliable arm's length ranges of results relative to country-specific arm's length ranges. Thus, the use of pan-European studies should generally be promoted, because they generate reliable results, as indicated by this study.

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## I. Introduction

The transactional net margin method (TNMM)<sup>1</sup> is a widely used transfer pricing method that compares the operating profits of a related company (i.e., the “tested” party) to an arm’s length range of operating profits developed from third party comparable companies. There is an emerging debate in Europe as to whether the third party comparable companies that form the arm’s length range of results under the TNMM should be selected only from a specific country (e.g., the country where the tested party resides) or whether a pan-European set of comparable companies provides a reliable measure of an arm’s length result.

This White Paper analyzes the issue whether Europe<sup>2</sup> is one market for purposes of transfer pricing analysis when an arm’s length comparison is performed using the TNMM and other transfer pricing methods that use third-party data from European databases.<sup>3</sup> We specifically analyze the important question whether it is appropriate to perform comparability analysis using a pan-European set of comparable companies or whether comparables data should be selected on a European country-specific basis. This question is extremely important for transfer pricing policy makers, tax practitioners, and multinational taxpayers who wish to achieve consistency in the application of transfer pricing methods and avoid placing undue cost burdens on taxpayers.

Our economic analysis follows comparability principles articulated in the OECD Transfer Pricing Guidelines for Multinational Companies (the OECD Guidelines)<sup>4</sup> and the process followed in our day-to day transfer pricing practice. We have performed rigorous

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<sup>1</sup> The TNMM is a profit-based transfer pricing method that examines the operating (net) profit margin relative to an appropriate base that a taxpayer realizes from a controlled transaction (*see* OECD Guidelines).

<sup>2</sup> For purpose of this paper, Europe is defined as the EU countries (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, and the United Kingdom) plus Norway.

<sup>3</sup> Although the TNMM is the transfer pricing method that most frequently requires the use of European databases, certain forms of the modified resale price method and the cost-plus method, as well as many residual profit split analyses, also require the use of third-party data from European databases.

<sup>4</sup> The OECD Guidelines provide transfer pricing principles and recommended practices for multinational enterprises and tax authorities relating to cross-border related-party transactions by multinational enterprises to secure the appropriate tax base and to avoid double taxation. All OECD member states agreed on the guidelines in July 1995.



statistical comparisons of the arm's length<sup>5</sup> results for groups of functionally comparable companies based on pan-European versus European country-specific comparables sets. Our TNMM comparables data includes both close functionally comparable data sets and broad functionally comparable data sets. We test all common attributes of the arm's length ranges, including the lower and upper quartiles, mean, and median using the most common, relevant profit level indicators (PLIs)<sup>6</sup> for the given comparables data sets.<sup>7</sup>

As we will describe in this White Paper, our statistical results strongly support the conclusion that arm's length ranges for comparable companies on a pan-European basis do not statistically differ from European country-specific arm's length ranges, with a few minor exceptions. These results are achieved even in countries such as Denmark, Sweden, and the United Kingdom that are currently not in the euro zone, and even though generally accepted accounting principles are not harmonized in Europe. Therefore, we conclude that Europe is one market for TNMM transfer pricing purposes, and that an arm's length range of results based on a pan-European set of comparable companies provides a reliable measure of arm's length results. Further, given that the number of closely comparable companies in any given country for a given functional and risk profile is limited or nonexistent (see the distribution of comparable companies in our data below), we believe a pan-European set of close functionally comparable companies will provide the most reliable arm's length range of results (and one that is consistent with the OECD Guidelines' comparability requirements) compared with country-specific comparables, which will often require less functional comparability to be produced.

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<sup>5</sup> The arm's length price is the price for a related-party transaction that a third party did or would have agreed to under the same or similar circumstances. The arm's length principle is the international standard that OECD member countries have agreed should be used for testing transfer prices for tax purposes.

<sup>6</sup> A profit level indicator is a measure of profits, such as operating profit margin or return on assets, for making profit comparisons between the related, "tested party" and third-party comparable companies.

<sup>7</sup> For example, we test the interquartile range of results based on the 25<sup>th</sup> percentile and the 75<sup>th</sup> percentile, which is the most commonly employed method of determining an arm's length range of results.

## II. The European Single Market Initiative

The economic question of whether profit results for potentially comparable third-party European companies can produce statistically similar arm's length ranges of results is fundamentally dependent on the legal and political development process of the European single market initiative. If the legal and political framework for European economic integration is still at an early stage of development, or if there are still significant transaction costs from intra-European trade, testing for Europe as one market for transfer pricing purposes would not be reasonable. We therefore briefly review the legal and political developments of the European market integration process.

The process of European economic integration has been characterized by over more than four decades of the effective removal of economic boundaries and market barriers. In addition, a political and institutional framework to enhance economic activities between the economies and to systematically reduce obstacles for cross-border transactions has been implemented. Our brief review of the history of the European single market initiative supports the conclusion that the most significant market impediments among EU member states have been abolished, and that the foundation for an integrated European market is already in place.<sup>8</sup>

### *a. Treaty of Rome of 1958*

The single market program has its origin in the Treaty of the European Economic Community (EEC) which together with the European Atomic Energy Community (EAEC) (jointly referred to as the Treaties of Rome) came into force in 1958. The EEC's goal was to establish a common market based on four freedoms -- freedom of movement of goods, persons, capital, and services -- and the gradual convergence of economic policies. The treaty was intended to eliminate trade barriers among member states with the aim of increasing economic prosperity and contributing to "an ever closer union among the peoples of Europe," as described by the treaty's authors.

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<sup>8</sup> This section is largely based on an EU history fact sheet found at: <http://www.europarl.eu.int/facts/>

To achieve these objectives the EEC Treaty laid down guiding principles and defined the framework for the legislative activities of Community institutions. These involved policies such as a common agricultural, transport, and commercial policy. The common market, the Treaty of Rome's main objective, was intended to liberalize exchanges of goods and services among member states as far as possible by:

- Creating a customs union, with the goal of eliminating customs duties among member states, and to establish a common external tariff; and
- Eliminating quantitative restrictions (i.e., quotas and measures having equivalent effect) to ensure the completely free movement of goods.

The Treaty of Rome provided for completion of a common market over a transitional period of 12 years, ending on 31 December 1969. However, its first goal, the customs union, was achieved in mid-1968.

***b. Further Harmonization in the Eighties***

A deceleration in progress toward the common market led the Community in the mid-1980s to consider a more thorough approach to the objective of removing trade barriers, with more effective methods to create an internal market. This approach was primarily set out in the Commission's White Paper of June 1985, and incorporated in the Treaty of Rome by the 1986 Single European Act (SEA). The White Paper was approved in 1985 by the European Council. It outlined about 300 legislative measures to accomplish the three main objectives, which were to eliminate:

- Physical frontiers, by abolishing checks on goods and persons at internal country borders;
- Technical frontiers, by removing the barriers of national regulations on products and services, by harmonization or mutual recognition; and
- Tax frontiers, by overcoming the obstacles created by differences in indirect taxes through the harmonization or approximation of VAT rates and excise duty.

The internal market was intended to create "an area without internal frontiers in which the free movement of goods, persons, services and capital is ensured." Moreover, it was accompanied by changes in the Community legislative system, designed to encourage adoption of the measures needed for its completion. The SEA became effective in 1987; its main objectives included creating a large internal market by January 1993. The SEA's

provisions for creating the internal market strongly supported an objective already set out in the original Treaties of Rome. By the deadline, most of the 1992 targets had been met: over 90 percent of the legislative projects listed in the 1985 White Paper had been adopted.

The Treaty on European Union, signed in Maastricht in 1992, came into force in November 1993. By instituting a European Union, the Maastricht Treaty marked a new step in the process of creating an ever-closer union among the European economies. The Union was based on the European Community, supported by policies and new forms of cooperation. According to the treaty, the Community's task is to promote a harmonious, balanced and sustainable development of economic activities, a high level of employment, sustainable and noninflationary growth, a high degree of competitiveness and convergence of economic performance, and economic and social cohesion among member states. The Community pursued these objectives by establishing a common market and by initiating a coordinated economic and monetary policy.

### *c. Monetary Union*

As early as 1978 the European Councils set up the European Monetary System (EMS) to solve the problem of monetary instability and to foster cohesion among member states. Established on a voluntary and differentiated basis, the EMS depended on the existence of a common currency unit, the ECU. Through the Treaty on European Union a European System of Central Banks, a European Central Bank, and a European Investment Bank had been set up. The main aims of monetary union were to finalize the completion of the single market by removing the uncertainty and costs inherent in currency-changing transactions, as well as costs of hedging against the threat of currency fluctuations, and by ensuring the total comparability of costs and prices throughout the Union.

By facilitating business and helping consumers, the EMS was expected to stimulate intra-Community trade and increase economic activity to reinforce Europe's monetary stability. The stages of EMU during the 1990s were intended to phase in the transition to the single currency so that the currency had a solid foundation, particularly through the prior achievement of a thorough convergence of economic and monetary policies.

***d. Harmonization of Legal Framework***

To further support the integration of the European market, rules on competition were introduced that focused on the following areas: competition policy and concerted practices; abuse of a dominant position and investigation of mergers; state aid; and, public undertakings and services of general interest. Moreover, EU member states' legislation were brought closer to a common base to promote economic cohesion, particularly in the areas of public contracts, company law, banking, insurance and securities, intellectual, industrial and commercial property, value added tax, excise duties (alcohol and tobacco), energy taxation, personal and company taxation, and fiscal policy.

Some issues regarding the completion of the internal market are still open. These include plans for further legal harmonization that are still pending, such as the statute for the European company, full freedom of movement for persons, and (personal and corporate) tax harmonization. Moreover, certain directives are not yet fully adopted in all member states, including those on public contracts, transport, and intellectual property. In addition, further harmonization measures focus on sectors with relatively lower levels of integration (such as the retail finance sector).

***e. Conclusion***

The history of the European single market demonstrates that the majority of market barriers that have their origin in the separation of European markets through national borders have been abolished. Moreover, national economic and monetary policies, the legal framework for economic activities, and national regulations have been largely harmonized or are about to be harmonized. Therefore, we believe the legal and political framework for European economic integration is already in place, and it is reasonable to consider tests of Europe as one market for transfer pricing purposes.

### III. Is Europe One Market? Overview of Previous Research

Our brief review of the history of European market integration shows that the legal and political barriers that would have prevented market integration have been removed or greatly reduced. However, what are the actual economic results of the EU's efforts toward integration? In other words, did the elimination of market barriers actually lead to closer economic relations and to increased activities between companies and/or consumers in the EU member states? If economic behavior followed the policy initiatives, we should observe market results, particularly prices for goods and services, costs for factors of production, and – most important for our investigation – measures of company profitability among the EU national economies converging. Therefore, we now briefly survey studies that have investigated the economic impact of the EU single market program.

In evaluating the impact and outcome on EU market results, one must consider that even in markets that are considered fully integrated -- for example, the United States -- regional market differences exist.<sup>9</sup> Profit variability between geographic regions within states might especially be driven by factors such as regionally different preferences, geographic conditions, market size, competitive situation, availability of substitute goods, levels of supply and demand, consumer purchasing power, the nature and extent of government regulation, production costs, and transportation costs.<sup>10</sup> In general, a main difference between markets that are not considered integrated and those that are considered to be integrated is the existence of regulatory and technical market barriers that prevent or restrict economic activities between the markets by, for example, imposing cross-border transaction costs. As discussed above, these state-imposed barriers have largely been removed in the EU market by the single market program.

Apparent market differences might also be induced by diverging regional preferences or by industry concentration based on factors that are not necessarily related to market

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<sup>9</sup> In this paper, "region" refers to a geographic and economic subunit below the national level.

<sup>10</sup> This list of factors that might constitute differences between market results follows the OECD Guidelines. These factors are discussed in more detail in section III.

integration. For example, the concentration of wine production and other foodstuffs manufacturing in certain regions is more likely a result of weather conditions than an indication of market concentration. These types of regional concentrations are also observable in economies that are considered fully integrated, for example, computer-related activities concentrated in Silicon Valley or steel industry concentrated in the rust belt in the Midwest United States. A similar logic applies to local regulations and/or subsidies that might be provided by local government within states. Therefore, the relevant economic question is not whether differences between markets exist, but how significant these differences are and whether they are more considerable than those observed in markets that are considered fully integrated.

Several studies have examined the impact of the single market program and the degree of integration reached in the European market, with the goal of assessing whether EU markets are highly integrated economic markets where economic activities of market participants are highly interdependent across national borders. This question has different interrelated aspects, each constituting a specific field of inquiry:

- Does market integration lead to a convergence of the price formation process, and do prices of goods and services and production costs in the different EU countries therefore converge?
- Have trade flows between the states' markets been increased and become as intense as intrastate trade?
- Are European capital markets becoming more integrated and do interest rates in Europe converge?
- As a result of increased market integration, are the returns of European companies converging and/or is the variability of their profitability decreasing relative to those of companies in other integrated markets?

We now briefly review the results of studies that examine these questions.

#### ***a. Price Convergence***

An indicator of the degree to which EU markets have integrated is price convergence, or the degree to which prices for the same goods or services have come closer together. Price convergence is expected to be more closely aligned when trade flows between the member states are high, since increased trade flows suggest that arbitrage between high- and low-price member states can occur. However, because prices also differ within a

given member state, the determination of the degree of price convergence among the EU member states requires the economist to measure price convergence between states on a relative basis, for example, relative to the degree of price convergence in other integrated economies, such as the United States or other applicable OECD countries.

In a recent study of international price comparisons to evaluate the existence of price convergence in the EU, researchers concluded that price differences within Member States appear, in many cases, as high as or even higher than price differences between Member States (especially the UK).<sup>11</sup> For most goods, the researchers found that price differences between the UK and the rest of the EU were minor compared to the differences between, for example, the EU and the United States. In another study commissioned by the UK government, ACNielsen concluded that for the bulk of goods for which comparisons could be made there was no significant difference in prices between EU member countries, as price differences were not larger than the spread of prices within the countries.<sup>12</sup>

If one compares the degree of price dispersion in the United States to that in the European Union, the European Union seems to have come very close to the degree of price convergence found in the United States.<sup>13</sup> For most goods, the overall price dispersion is much larger in the United States than in the European Union. Moreover, price dispersion for tradable goods in the European Union was reduced by 50 percent between 1990 and 1999. Serres et. al. examine cross-border price differentials in the European Union in comparison to other OECD countries.<sup>14</sup> They report that the border effect in the European Union is significantly lower than that observed between Canada and the United States.

The European Commission regularly monitors price convergence among EU member states.<sup>15</sup> Its studies show price convergence during the 1990s, but a decelerated

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<sup>11</sup> See Haskel and Wolf, From Big Macs to iMacs: What Do International Price Comparisons Tell Us?, Working paper, 2000.

<sup>12</sup> See ACNielsen, A Report on International Price Comparisons, 2000.

<sup>13</sup> Copenhagen Economics: The internal market and the relevant geographic market, 2003, p. 21 ff.

<sup>14</sup> A. de Serres et al., The Width of the Intra-European Economic Borders, OECD ECO/WKP (2001) 30.

<sup>15</sup> See for example [http://europa.eu.int/comm/internal\\_market/en/update/](http://europa.eu.int/comm/internal_market/en/update/).



convergence process since 1997. Most notably, consumer prices have converged, with some exceptions. Moreover, price convergence among the six EU founding member states is very tight.

### ***b. Intra-EU Trade Flows***

Trade flows among EU member states, measured relative to GDP, have increased significantly since the early 1990s.<sup>16</sup> Moreover, trade border effects, which measure whether international trade deviates from intranational trade, seems to have decreased substantially from the late 1980s to the mid 1990s. This indicates that the market has become much more integrated through the single market program.

The European Commission reports steady growth of intra-EU trade, which in 2001 amounted to over 17 percent of EU trade.<sup>17</sup> Only trade in the services sector is low; further integration in the services sector would require the more intensive application of mutual recognition procedures.

### ***c. European Financial Market Integration***

The Euro area government bond market is considered highly integrated.<sup>18</sup> The elimination of exchange-rate risk led to a significant convergence in bond yields among the Euro area member states, although minor yield spreads have persisted, mainly due to still existent institutional and size factors. The interbank market is also considered highly integrated.<sup>19</sup> Integration of the private Euro bond market has also progressed and is expected to proceed more rapidly in the near future because of increased cooperation between supervisory bodies and regulators. Europe's corporate bond grew significantly at the beginning of the new millennium. However, it suffered under difficult market conditions and increased investment risks during the last two years.

Integration appears to be still in process in the mortgage market, the corporate loan market and in credit market conditions. However, in general, the Euro area financial

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<sup>16</sup> See Copenhagen Economics, p. 17 ff.

<sup>17</sup> See European Commission, Functioning of EU Product and Capital Markets, COM(2002) 743 final.

<sup>18</sup> See Commission of the European Communities, The EU Economy: 2002 Review, COM(2002) 712 final.

<sup>19</sup> Adam et. al. Analyse, Compare, and Apply Alternative Indicators and Monitoring Methodologies to Measure the Evolution of Capital Market Integration, Salerno 2002.

sector experienced a significant structural change, with deeper integration of national markets and increased competition between available instruments and intermediaries.<sup>20</sup>

In equity markets the introduction of the Euro eliminated exchange risk and thereby stimulated cross-border equity investments.<sup>21</sup> Internationalization of equity issuance, more cross-border mergers and acquisitions, and the consolidation of stock exchanges have enforced cross-border activities. In addition, it is also evident that investor behavior has changed from country-based toward cross-border investments. Although national differences between stock markets remain with respect to market capitalization and the number of initial public offerings (IPOs)<sup>22</sup> these are probably more an indication of increased regional specialization and concentration of equity markets (exchanges) in an integrated European market. However, due to the liberalization of capital markets and globalization, the market for wholesale financing has developed substantially and has become more integrated and competitive. It seems that larger companies in particular have access to international financing markets, whereas only very small firms still depend on their local financial system.<sup>23</sup>

#### ***d. Profit Convergence***

Net profit (defined as profits after operating expenses) convergence by independent companies operating in the EU member states is the measure of market convergence that is most consistent with the transfer pricing question “Is Europe One Market?” for the application of the TNMM and related transfer pricing methods. Although we have found no research that directly addresses this question from a transfer pricing perspective, there is research that investigates company profitability within the EU and compares and contrasts the findings to those in other significant markets, such as the United States and Japan.

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<sup>20</sup> See “Commission of the European Communities, The Euro Area In The World Economy – Developments In The First Three Years,” p. 30 ff.

<sup>21</sup> See Commission of the European Communities, p.34 f.

<sup>22</sup> See European Commission: Benchmarking enterprise policy, Results from the 2002 scoreboard, SEC(2002) 1213.

<sup>23</sup> See same place, p. 25.

Meric et al. compare the profitability of Japanese, EU and U.S. manufacturing firms operating in three major manufacturing industries (chemicals, industrial machinery, and electronics) over the 1996-2000 period.<sup>24</sup> The authors compare financial diagnostic and profitability ratios, including the operating profit margin (OPM)<sup>25</sup> and the return on assets (ROA)<sup>26</sup> for these manufacturers using a multivariate analysis of variance.<sup>27</sup> One of their findings is that, for the ROA, OPM, and other relevant profit indicators measured, EU variances in profitability is always lower than that of Japan, but not always lower relative to the United States (although, for example, the ROA for the EU chemical industry has a lower variance than that of the United States). One could conclude from this analysis that the variance of profitability in the European Union is not generally higher than that of other markets considered fully integrated, particularly Japan. Therefore, based on their analysis, there is no reason to conclude that company profits in the European Union are more dispersed than in other fully integrated markets.

A comparison of the profitability spreads between enterprises of different size (small versus large) on the basis of the BACH database<sup>28</sup> results in a considerably lower profit spread for the observed European countries than in Japan and the United States.<sup>29</sup> The same study also compares profitability results among different European countries. However, because no statistical test is applied the results are difficult to interpret, and no clear result regarding profit convergence can be derived. An extensive study of financial structure and profitability based on the BACH database does not derive results regarding

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<sup>24</sup> Ilhan Meric et al., "A Comparison of the Financial Characteristics of U.S., E.U., and Japanese Manufacturing Firms," in *American Business Review*, June 2002, 20, 2, p. 119

<sup>25</sup> The OPM is the ratio of operating profit (profits related to operating activities before interest and taxes) to sales. Operating profits and net profits are used interchangeably in this paper.

<sup>26</sup> The ROA is equal to operating profit (profits related to operating activities before interest and taxes) divided by average total assets.

<sup>27</sup> They use the Disclosure/Worldscope database for their analysis. The EU is considered as one integrated economic area, that is, EU Company data constitutes one sample which is compared to the US and the Japanese data samples.

<sup>28</sup> The "Business Accounts Harmonized Databank" is managed by the European Commission (DG for Economic and Financial Affairs). It contains aggregate and harmonized information on annual accounts of non-financial enterprises and covers 11 European countries, Japan and the US for the years 1990-1996. It includes less than 140,000 European companies. The data is mainly provided by Central banks or Ministries of the respective countries. For further details see European Commission, Directorate-General For Economic and Fiscal Affairs, Supplement A, No 11/12, 1998, p.4.

<sup>29</sup> European Commission, Directorate-General For Economic and Fiscal Affairs, Supplement A, No 11/12, 1998.

the comparability of European companies' profits either, and therefore does not contribute to our investigation.<sup>30</sup> The same conclusion applies to a study of the German Bundesbank comparing returns on equity (ROE),<sup>31</sup> which finds that because of diverging financial structures this PLI does not provide a reliable basis for international profitability comparisons.<sup>32</sup>

Criton and Walton examine the ratio of profits to capital employed of Euro-area countries and their major trading partners, and conclude that profits have not converged in the Euro area.<sup>33</sup> However, their data is not further described (unclear database and number of overall companies); therefore, we cannot evaluate how representative their results are. Furthermore, their conclusions are not based on statistical tests. Moreover their profit level indicator seems to be based on an arbitrary determination of the asset base. In addition, their potential explanations for the deviations (investment flows are insufficient to reduce profitability differentials, incompletely integrated markets, and insufficient data - especially no observation of post-tax rates) are not substantiated by further economic analysis.

Therefore, no systematic statistical analysis of company profitability within the European Union has yet been prepared that provides an answer to the question whether it is economically justifiable to perform pan-European comparability studies under the TNMM or related methods as compared to country-specific TNMM comparability studies. However, many of the existing studies on company profitability generally seem to indicate that the variability of profits in the European Union is comparable to that in fully integrated markets such as Japan and the United States.

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<sup>30</sup> Rivaud-Danset et al., "Comparison Between the Financial Structure of SMES and That of Large Enterprises (LES) Using the BACH Database," Economic Paper, Nr. 155, July 2001.

<sup>31</sup> The ROE is equal to a fiscal year's after-tax income divided by the book value of equity.

<sup>32</sup> Deutsche Bundesbank, „Zur Unternehmensrentabilität im internationalen Vergleich,“ *Monatsbericht* Oktober 1997.

<sup>33</sup> Laura Criton, Richard Walton: "International comparison of Company Profitability," *Economic Trends*, No 587, 2002.

### *e. Summary of Previous Research*

We have analyzed previous research to determine whether it addressed or provided valuable insight into the question whether pan-European comparability analysis could be appropriate when applying the TNMM and other relevant methods using databases of third-party comparable companies. The previous research we have reviewed includes studies on price convergence, intra-EU trade, European financial market integration, and profit convergence. In general, the body of research reviewed indicates that European markets are integrating (or are already integrated) and that in many ways the levels of price or profit differences among European countries are not meaningfully different than the differences found in integrated markets such as Japan and the United States.

Of all studies we have reviewed, those that come closest to our investigation are the studies that explore profit convergence. However, none of the studies directly addresses the question from a transfer pricing comparability perspective. The studies that address price convergence are very important, but for transfer pricing purposes are generally more directly relevant to the application of the comparable uncontrolled price method (CUP)<sup>34</sup> and the other transaction-based methods (for instance, the resale price<sup>35</sup> and cost-plus methods<sup>36</sup>). The studies that evaluate the level of intra-EU trade and the level of European financial market integration are important from a consistency perspective, because intra-EU trade and European financial market integration are important mechanisms to ensure the convergence and homogeneity of profits among EU member states.

We now turn to our analysis to review what the OECD Guidelines detail about the issue and to develop our model for empirical testing.

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<sup>34</sup> According to the OECD Guidelines, the CUP method is a transfer pricing method that compares the price for property or services transferred in a controlled transaction to the price charged in a comparable uncontrolled transaction under comparable circumstances.

<sup>35</sup> According to the OECD Guidelines, the resale price method is a transfer pricing method that compares the gross profit margin that an associated enterprise earns in a related-party transaction to the gross profit margin earned in comparable third-party transactions.

<sup>36</sup> According to the OECD Guidelines, the cost-plus method is a transfer pricing method that compares the profit per unit of cost that an associated enterprise earns in a related-party transaction to the profit per unit of cost earned in comparable third-party transactions.

## **IV. Comparability and Markets in the OECD Guidelines and the TNMM Comparability Analysis Process**

To test whether, under the applicable OECD comparability criteria, a pan-European comparability analysis for the TNMM and related methods is justified, we performed a significant number of statistical tests using TNMM comparables results. Specifically, we generated a large number of data sets consisting of both closely and broadly comparable third-party data and statistically compared the country-specific arm's length ranges to the pan-European arm's length ranges. This statistical analysis is presented in the next section.

In this section we present the transfer pricing foundations of the tests that will follow in the next section. In particular, we first review the OECD Guidelines' discussion regarding markets and economic circumstances. Next, we review the OECD Guidelines' comparability criteria applicable to the TNMM. Finally, we describe the process of identifying comparable third-party companies under the TNMM in the context of the OECD Guidelines.

### ***a. Market Comparability for the TNMM in the OECD Guidelines***

The OECD Guidelines do not specifically address market comparability issues that are relevant for the application of the TNMM.<sup>37</sup> Instead, comparability of economic and market circumstances is addressed as comparability factors to be considered when evaluating all transfer pricing methods under the general comparability discussion found in Paragraph 1.30. The guidance is therefore general in nature, with a greater emphasis on pricing factors relevant to the CUP than on profitability factors relevant to the application of the TNMM.

The OECD Guidelines recognize that prices may vary across markets. Therefore, the markets in which the comparable companies and the related parties operate should be

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<sup>37</sup> That is, market comparability is not addressed as part of the TNMM comparability factors discussed at Paragraphs 3.34 – 3.40).

comparable, or that any differences in the markets should not have a material effect on the price or that appropriate adjustments can be made for the market differences.<sup>38</sup>

In evaluating market comparability, the OECD Guidelines suggest that the economic circumstances that could be relevant include:

- geographic location;
- the size of the markets;
- the extent of competition in the markets and the relative competitive positions of the buyers and sellers;
- the availability of substitute goods and services;
- the levels of supply and demand in the market as a whole and in particular regions, if relevant;
- consumer purchasing power;
- the nature and extent of government regulation of the market;
- costs of production, including the costs of land, labor, and capital;
- transport costs;
- the level of the market (retail or wholesale); and
- the date and time of transactions.

The comparability factors indicated above can be important components in assessing whether defined markets are comparable to one another, but they do not offer a transfer pricing practitioner clear guidance on how to define or assess what the relevant market is for purposes of applying the TNMM. It is clear, however, that there is no explicit language in the OECD Guidelines that defines a market by national boundaries. But the OECD Guidelines' market guidance does not directly address the issue of using pan-European versus country-specific comparable companies.

There are certain characteristics in the EU market that appear at least consistent with a "Europe is one market" argument based on the OECD Guidelines list above. For example, the EU member states are primarily geographically contiguous, have a

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<sup>38</sup> One would presume that this reference to price differences can also apply to profit differences across markets, although this point is not explicitly addressed in the OECD Guidelines.

harmonized level of government regulation, have a commonality of currency in many member states, and low barriers to the movement of goods, people, and capital. Nevertheless, while these factors are consistent with market convergence, they in and of themselves do not clearly lead to a conclusion that Europe should be considered one market for TNMM transfer pricing purposes. Empirical testing is required to analyze this issue.

***b. General Comparability for the TNMM in the OECD Guidelines***

Comparability analysis underlies the issue of whether pan-European or European country-specific third-party data is more appropriate when applying the TNMM and other relevant methods that use European databases. Therefore, the OECD Guidelines' TNMM comparability criteria are important factors in analyzing the issue of pan-European versus country-specific comparables sets.

The OECD Guidelines indicate that taxpayers should assess the following general factors when establishing comparability under the TNMM:

- Product and functional similarity;
- Industry forces, such as the threat of new competition, varying cost structures, the cost of capital, industry experience, etc.; and
- The ability to measure profits consistently between the taxpayer and potentially comparable companies.

We understand that the basic intent of the TNMM comparability criteria in the OECD Guidelines is to ensure that the net operating profit comparison between the third-party comparable companies and the taxpayer provides a clear indication as to whether the taxpayer is employing arm's length transfer pricing policies. Therefore, other material factors that could cause a difference in the profits earned by third-party comparable companies relative to a taxpayer tested party should be reasonably eliminated. The OECD Guidelines recognize that it may not be possible to eliminate all functional, risk, and other differences so that an arm's length range of results is generally appropriate for the comparison between a tested party taxpayer and the third-party comparable companies.



Given our understanding of the OECD Guidelines' TNMM comparability criteria, we believe the correct methodological approach in evaluating the question of a pan-European comparables set versus a country-specific comparables set is to test whether there are "material factor(s)" that cause the results of the pan-European arm's length range to differ from the results of the country-specific arm's length range. In other words, if the arm's length range of results determined on a pan-European basis is statistically equivalent to the arm's length range of results determined for specific countries, then there are no material factors that make the country-specific arm's length ranges more comparable than the pan-European range. Therefore, the OECD Guidelines would not require that a country-specific comparability criterion be added, and a pan-European comparables analysis approach would be defensible and provide reliable results.

### ***c. Comparability Analysis Process under the TNMM***

In this section we will explain the comparability analysis process under the TNMM. We describe this process to both outline the approach we have applied to generate our statistical samples for pan-European and European country-specific comparables data sets in the next section, and to review, in a very practical way, how country-specific comparability criteria would be specified for a European country-specific comparability search versus no country-specific comparability criteria for a pan-European comparability analysis.

#### **1. European Financial Database**

Deloitte's European transfer pricing practices generally use the 1,000,000 company version of the Amadeus database published by Bureau van Dijk; this database is also widely used by European tax authorities and other transfer pricing practitioners.<sup>39</sup> The Amadeus database contains a large distribution of financial data for companies located in every European country, although the representation of companies whose financial data is reported by country is not homogeneous. It is widely known, for example, that many German companies do not file their financial results with the authorities, so that this information does not appear in the Amadeus database. Our report on the distribution of

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<sup>39</sup> Appendix 1 provides a description of the different European data bases aggregated to the Amadeus 1,000,000 company version.

the companies that we use in our empirical tests in the next section also confirms that the representation of companies is uneven.<sup>40</sup> Therefore, taxpayers in certain countries who use the TNMM have little choice but to use third-party comparable companies from other countries; this is a common situation in the smaller European countries and in Germany, where available data is limited.

Although the database contains over 1,000,000 companies, not all companies are potentially comparable companies for any given taxpayer. Many companies are subsidiaries of multinational or national companies, so results could be influenced by transfer pricing issues. We therefore eliminate from further consideration companies where one shareholder owns more than 49.9 percent of the shares.<sup>41</sup> The database also includes many small companies that may have unique facts and circumstances.<sup>42</sup> Ordinarily, depending on the facts and circumstances, we will not consider as potentially comparable companies classified as “small companies” based on the relevant European agencies. All companies with a date of incorporation less than five years ago are excluded from the set, because their results could be affected by start-up activities. Finally, any companies that did not report their financial data for at least the preceding three years are excluded.

## **2. Refining the Comparability Analysis**

Once the high-level database comparability analysis is performed, comparability assessment turns to a more specific focus on the relevant functional and risk profile for the potentially comparable companies. For example, NACE codes--statistical classifications of the economic activities of companies in the European Union--are selected to broadly describe the relevant functions and product characteristics of the

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<sup>40</sup> Of course, there are also economic and operational factors that will also affect this representation, including potential industry concentrations in certain geographic regions or countries, and the fact that certain European countries are much smaller and therefore have fewer companies relative to larger countries.

<sup>41</sup> So, at this stage of the comparability analysis, we only employ a percentage ownership test, because this is what the database reports. It is common to also assess related party based on an “ability to control” criteria, but this is more fact-specific and must be performed when factually analyzing individual companies. Also note that we will not eliminate consolidated parent companies based on this comparability criteria since their results are, by definition, arm’s length.

<sup>42</sup> For example, financial statements that may not be audited, owners could be compensated by salary or as residual claimants in the profits, etc.

taxpayer. NACE codes, several of which are often assigned to companies, help the transfer pricing practitioner to determine the product categories in which the companies compete and whether the company is classified as a manufacturer, distributor, service company, etc. Next, keyword searches, which will ordinarily specify “key” facts that should be included or excluded in a potentially comparable company’s description, are specified and processed. For example, if the search is for a wholesale distributor, keywords that describe a company as performing “retailing,” “manufacturing,” or “proprietary research” will likely cause the company to be rejected from further consideration as potentially comparable. Depending on the results of the keyword search, high-level screening of certain diagnostic ratios may also be helpful in assessing comparability. For example, a high fixed assets-to-sales ratio could indicate that a potentially comparable company is involved in manufacturing rather than wholesale distribution. Or a large percentage of interest income and expense could indicate that a company is involved in financing activities.

### **3. Finalizing the Comparability Analysis**

One of the last steps in comparability analysis is a qualitative search for the potentially comparable company’s functions, risks, characteristics, etc. using, for example, the company’s web site and/or databases of factual information (for instance, newspaper and magazine articles). This analysis is based on specified criteria detailing the most important comparability factors that drive the taxpayer/tested party profits. Typically the transfer pricing practitioner will review the previous criteria that were employed to confirm the facts, but the greater amount of factual information will allow the practitioner to further assess the comparability of the facts and circumstances than otherwise could be the case. For our research in the next section, we did not perform this last step. The statistical rationale for this approach is that we needed to ensure that we had a sufficient number of statistical observations so that we could generate statistically reliable conclusions.

#### ***d. Summary***

Since there is no clear definition of a market in the OECD Guidelines that would allow us to determine whether a pan-European or country-specific comparables analysis is

appropriate for applying the TNMM and related methods, we have developed an empirical testing approach to analyze this issue. Our approach is based on the TNMM comparability criteria as articulated in the OECD Guidelines and a standard approach to performing TNMM analyses based on the OECD Guidelines. Our research and the results of the statistical tests are presented in the next section.

## V. Empirical Analysis of “Is Europe One Market?”

We now detail our research and describe the results of our empirical analysis.<sup>43</sup> We have taken two approaches to our statistical testing. The first approach, which we refer to as the specific comparability tests (Specific Tests), are designed to generate testable comparability data that closely replicates the standard comparability analysis process described in Section IV. The effort required to generate comparability data under the Specific Tests approach is significant, so that we have concentrated the Specific Tests on selected functional and risk comparability areas that provide a high representation of actual comparability analysis we have performed over the last several years. For each functional and risk profile we have chosen, comparable companies are selected by using comparability selection criteria that match the characteristics of the specific profile. We then develop arm’s length ranges by country and on a pan-European basis to statistically test whether the country-specific arm’s length ranges deviate from the ranges for the pan-European set of comparable companies.

To generalize the Specific Tests to allow us to make inferences with regard to broader functional categories, we also performed tests using broader comparability selection criteria (Broader Tests). These Broader Tests are designed to confirm and generalize the conclusions drawn from the Specific Tests analyses. The Broader Tests are based on data from approximately 38,000 independent European companies, covering relevant manufacturing, distribution and services industries. Screening for comparables from a particular industry is done by using the appropriate (up to four digits) NACE codes.<sup>44</sup>

We did not specify comparability criteria in either test, or otherwise adjust the company financial data for potential differences in profits that result from foreign exchange

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<sup>43</sup> We will make the data used in our research available to interested parties upon request, subject to the approval of Bureau van Dijk, the data provider.

<sup>44</sup> NACE Rev. 1 (statistical classifications of economic activities in the European Community) is a classification designed for data referring to the unit of activity. It serves as a basis for compiling statistics on the industry, factors of production (labor, raw materials, energy, etc.), fixed capital formation operations and financial operations of these units of activity. NACE Rev. 1 was made compulsory by Council Regulation (EEC) No 3037/90, which was subsequently amend by Commission Regulation (EEC) No 761/93. It is fully harmonized with the industry classification of the Member States and the United Nations.

exposures (e.g., Euro zone versus non-Euro-zone countries/businesses) or from differences in generally accepted accounting principles in the relevant countries. Because Euro foreign exchange exposures and generally accepted accounting principle differences could affect company profit results and therefore be a material comparability factor in the decision to use pan-European versus country-specific comparability sets, we believe it is appropriate to leave any potential impact of these items in the data and to draw statistical conclusions with these potential impacts presents.

We now describe the process of data generation, discuss the main characteristics of the data, describe the statistical methods applied, and present and interpret the results.

### *a. Specific Tests*

Again, the Specific Tests are designed to replicate as closely as possible Deloitte's TNMM approach in our daily practice.<sup>45</sup> For the Specific Tests we have analyzed the following functional and broad industry categories:

- Manufacturing:
  - Automotives
  - Electronics
- Distribution
  - Chemicals
  - Electronics

These functional and broad industry categories were selected because they comprise a large, representative percentage of the TNMM comparables analysis we have performed in our practice in recent years.<sup>46</sup> Further, these comparable groupings represent a significant portion of European production and foreign trade. Chemicals, Electronics, and

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<sup>45</sup> The only difference between the TNMM analysis performed here and the TNMM we perform daily in our practice is that we did not perform the last qualitative screening in our tests here. This qualitative screening process was not performed in the Specific Tests so that we had sufficient statistical data by country that we could draw statistical inferences regarding the pan-European versus country-specific issue. We do not believe this approach would introduce any bias from a country-by-country perspective; therefore, we fully believe the results presented here are valid in the context of the TNMM.

<sup>46</sup> Specifically, these functional and broad product groupings encompass approximately 50 percent of the comparability analyses performed in Deloitte's Düsseldorf office in the last three years.

Automotives account for more than 35 percent of current European production and are therefore frequently part of cross-border related-party analysis.<sup>47</sup>

We have performed distribution and manufacturing functional testing using three broad product categories. For each of these four tests, a separate TNMM comparability selection criterion was developed, including NACE code selections, and qualitative and quantitative screens described in the previous section. The table below summarizes the comparability selection criteria applied and the size of the resulting data sets.<sup>48</sup>

	<b>Automotive Manufacturing</b>	<b>Electronics Manufacturing</b>	<b>Chemicals Distribution</b>	<b>Electronics Distribution</b>
<b>Geographic Area</b>	Austria, Belgium, Denmark, Ireland, Finland, France, Germany, Greece, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, UK			
<b>NACE Rev. 1 Codes</b>	34xx: Manufacture of motor vehicles, trailers and semi-trailers 3541: Manufacture of motorcycles 355x: Manufacture of other transportation equipment n.e.c.	30xx: Manufacture of office machinery and computers 32xx: Manufacture of radio, television & communication equipment	5112: Agents involved in the sale of fuels, ores, metals, and industrial chemicals 5155: Wholesale of chemical products	5184: Wholesale of computers, computer peripheral equipment and software 5185: Wholesale of office machinery and equipment 5186: Wholesale of electronic parts and equipment
<b>Industry Description (inclusions)</b>	Product*, Manufac*, Fabric*, Auto*, Car*, Motor*, Vehicl*, Cycl*, Engin*, Equip*, Frame*, Spare*, Part*, Accessori*	Product*, Manufac*, Fabric*, Electro*, Compu*, Peripher*, Tele*, Radio*, Communic*	Trade*, Distrib*, Sale*, Deal*, Wholesale*, Agent*, Commission*, Chemi*, Agri*, Fluor*, Cool*, Lac*, Wax*, Labor*	Trade*, Distrib*, Sale*, Deal*, Wholesale*, Agent*, Commission*, Electro*, Compu*, Peripher*, Tele*, Radio*, Communic*

<sup>47</sup> Calculation based on Eurostat (2003), Statistik kurz gefasst 39, p. 5.

<sup>48</sup> Since the screening for independence, incorporation date and number of available financial reporting periods are the same for all data sets, these criteria are left out in the table. An asterisk indicates that all words beginning with the preceding letters are considered.

	<b>Automotive Manufacturing</b>	<b>Electronics Manufacturing</b>	<b>Chemicals Distribution</b>	<b>Electronics Distribution</b>
<b>Industry Description (Exclusions)</b>	Trade*, Distrib*, Sale*, Deal*, Wholesale*, Retail*, Agent*, Commission*, Assembl*, Research*, Develop*, Design*, Consult*, Service*, Install*, Extract*, Holding*, Ship*, Boat*, Train*, Track*, Tram*, Air*, Space*, Locom*, Rail, Compu*, Tele*,	Trade*, Distrib*, Sale*, Deal*, Wholesale*, Retail*, Agent*, Commission*, Assembl*, Research*, Develop*, Design*, Consult*, Service*, Install*, Extract*, Holding*, Agri*, Auto*, Car*, Chemi*, Consume*, Engine*, Fuel*, Glass*, Medical*, Ship*, Textile*	Retail*, Assembl*, Research*, Develop*, Design*, Consult*, Service*, Install*, Extract*, Holding*, Auto*, Car*, Consume*, Engine*, Elec*, Compu*, Tele*, Communic*, Pharma*, Glass*, Ore*, Metal*, Coke*, Medical*, Ship*, Textile*	Retail*, Assembl*, Research*, Develop*, Design*, Consult*, Service*, Install*, Extract*, Holding*, Agri*, Auto*, Car*, Chemi*, Consume*, Engine*, Fuel*, Glass*, Medical*, Ship*, Software*, Textile*
<b>Size of Data Set (# Companies)</b>	945	1,436	769	2,124

**Table 1: Summary of Screening Process for Specific Tests**

### 1. Refinement of the Comparability Selection Process for the Specific Tests

As outlined in the table above, the comparability analysis process results in data sets ranging from 769 to 2,124 companies. As we briefly mentioned above, in an ordinary comparability search these sets would have been further narrowed down by the application of individual qualitative screening of companies. Such a process would ordinarily generate a final set of 5 to 20 companies, but this sample size is much too small for a valid statistical analysis aiming at European-wide relevance. Given the premise that a majority of European countries should be included in the set, and our belief that this approach does not introduce a country-specific bias into our statistical analysis (which could render our conclusions invalid), we have chosen to balance the broadness of the data (number of companies in a set) with the deepness of the data (functional heterogeneity of companies in the set).

Because we did not perform the final, detailed qualitative screening, we eliminated extraordinary outliers under the assumption that companies with either extraordinarily



high profits or extraordinarily low profits have functional and/or risk differences that we did not identify. Specifically, we eliminated outliers with operating margins below minus 5 percent and above 15 percent (based on a three-year average) for the operating margin statistical tests. We also eliminated companies with a return on assets below minus 10 percent and above 20 percent.<sup>49</sup> Although these criteria are conservative for our purposes, to confirm that they are not the reason for our statistical conclusions, we also ran sensitivity tests that increased and decreased the loss and profit parameters for rejection. No material change in the conclusions resulted from this sensitivity analysis. Finally, we excluded companies with sales of less than €2,000,000 from the sets.

The following data table summarizes characteristics of the four final data sets on an aggregated level for all included European countries.<sup>50</sup>

	<b>Automotive Manufacturing</b>	<b>Electronics Manufacturing</b>	<b>Chemicals Distribution</b>	<b>Electronics Distribution</b>
<b>Size of Data Set (# Companies)</b>	505	748	754	1,386
<b>Mean Sales (€Thousands)</b>	12,236	9,773	13,503	10,847
<b>Profit Level Indicator</b>	Return on Assets (ROA) in %		Operating Profit Margin (OPM) in %	
<b>Mean</b>	7.34	6.65	3.45	3.32
<b>Lower Quartile</b>	3.61	2.52	1.28	1.17
<b>Median</b>	6.92	6.49	2.76	2.77
<b>Upper Quartile</b>	11.68	11.24	4.70	4.97

**Table 2: Aggregated Data Sets for Specific Tests**

Appendix 2 provides a broad summary of the underlying data at the country level.

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<sup>49</sup> Since the dispersion of the return on assets is higher than the dispersion of the operating margin, we used an even wider range for this profit level indicator.

<sup>50</sup> A complete data table including the figures calculated for each country can be found in the Appendix. Austria, Ireland and Luxemburg have been removed from the sets because there were no observations left after applying the screening criteria. Sales and profit figures are three-year averages based on figures from FY2001 and the two prior years. ROA is an asset weighted average and OPM is a sales weighted average over the three pertinent years.

## 2. Outcome of the Specific Tests – Uneven Data Distribution by Country

It is important to point out one result of the search process that supports a pan-European approach to TNMM comparables analysis – the comparables data is not homogeneously distributed in all European countries. In addition to economic factors that could explain this phenomenon, it is also true that companies in certain countries – notably Germany – do not report their financial data as frequently as companies in other countries, and that smaller countries will not have the depth and breadth of companies as larger countries. Therefore, for certain countries it is simply not possible to perform country-specific searches, even if it were theoretically justified under the OECD Guidelines.

From a statistical results perspective, one must carefully consider the results when the sample size in a country is small and the reason for the sample size are that companies do not report their financial results. However, the statistical results do lead to valid interpretation when the sample size is small because the population of companies in a country is small. In any case, the Broad Tests performed below will also correct for this potential issue to a greater degree than the Specific Tests.

For the Specific Tests, the following are the countries that had less than five companies in the data set.

<b>Automotive Manufacturing</b>	<b>Electronics Manufacturing</b>	<b>Chemicals Distribution</b>	<b>Electronics Distribution</b>
Austria, Denmark, Germany, Ireland, Greece, Luxembourg	Austria, Ireland, Greece, Luxembourg	Austria, Denmark, Germany, UK, Ireland, Luxembourg, Netherlands, Norway, Portugal	Austria, Belgium, Denmark, Germany, Ireland, Luxembourg

**Table 3: Data Sets With Less Than Five Companies From a Specific Country**

Several points regarding the distribution of companies in Table 3 are relevant to the issue of pan-European versus country-specific TNMM comparability analysis:

1. Belgium, Greece, and Denmark are among the smaller EU members, and generally have a smaller population of potentially comparable companies due to their size;

2. While the Chemicals Distribution samples of countries with under five companies represented may be somewhat surprising, recall that related companies are excluded as part of the comparability criteria, which could explain why the Netherlands, the United Kingdom, and others show up in this column; and
3. The German results are directly related to the fact that it is not common for German companies to report their financial results.

A transfer pricing analyst performing a country-specific TNMM analysis for Chemical Distributors, for example, would obtain a low number of comparable companies in his/her country (and recall that we have a relaxed comparability criteria compared to a country-specific search). The analyst could be forced to relax the selection criteria to include companies that are less functionally comparable. Again, the other alternative would have been to perform a pan-European comparables analysis using more specific, refined comparability criteria.

### **3. Statistical Analysis of the Specific Tests**

As we discussed in Section IV, the OECD Guidelines provide for a range of arm's length results. European tax authorities may have different policies with regard to adjusting taxpayers whose results fall outside the range; some tax authorities may adjust the taxpayer to the midpoint in the range, whereas other tax authorities may adjust the taxpayer to the most favorable or least favorable point in the range. For this reason, we have statistically tested both the upper/lower quartiles of the arm's length ranges and the measures of central tendency of the ranges on a country-specific versus pan-European basis. While the measures of central tendency are important, we believe the statistical tests of the country-specific interquartile ranges versus the pan-European interquartile ranges are the most important for our analysis.<sup>51</sup> The interquartile range is the distance between the 25<sup>th</sup> and the 75<sup>th</sup> percentile of a distribution for a given variable. In other words, the interquartile range includes only companies with profits above the lower 25 percent of companies and below the upper 25 percent of companies.

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<sup>51</sup> The OECD Guidelines describes the inter-quartile range at Paragraphs 1.45 to 1.48. See also Sec. 1.482-1(i)(iii)(c) of the US Internal Revenue Code for a description of the interquartile range in the US regulations.

### **Interquartile Range Tests for Specific Tests**

The tests of the interquartile range statistically compare the equality of the first and third quartiles (i.e., the interquartile arm's length profit ranges of results) for each comparables set (i.e., the two manufacturing and two distribution sets) on a single-country basis versus a pan-European basis. Therefore, we are testing the statistical hypothesis that an arm's length range developed from comparables in each country is not different from an arm's length range developed based on the full set of pan-European comparable companies. Technically, we are testing the null hypothesis ( $H_0$  hypothesis) that the lower quartile and the upper quartile of a comparable companies' TNMM range based on country-specific data are equal to the 25<sup>th</sup> percentile and the 75<sup>th</sup> percentile of the respective comparable companies' TNMM range based on pan-European data. Each quartile is separately tested.<sup>52</sup> We use a 95 percent confidence interval for these tests, meaning that we will reject the null hypothesis that the lower and/or upper quartiles of the country-specific arm's length range versus is equal to those of the pan-European range whenever the test statistic (i.e., p-value) falls outside the 95 percent confidence interval.

For example, the series of tests for Automotive Manufacturers will include a test for France in which we will statistically compare the interquartile range of the 126 French Automotive Manufacturers with the interquartile range of all 505 European Automotive Manufacturers. In particular, we will statistically compare:

- the 25<sup>th</sup> percentile of the arm's length range based on return on assets for comparable Automotive Manufacturers in France, 3.94 percent, versus the comparable Automotive Manufacturers pan-European arm's length range, 3.61 percent; and,
- the 75<sup>th</sup> percentile of the arm's length range based on return on assets for comparable Automotive Manufacturers in France, 11.92 percent, versus the

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<sup>52</sup> When the data sets consist of an equal number of observations, we calculate the median, the 25<sup>th</sup> percentile and the 75<sup>th</sup> percentile by always using the average of the middle two observations. For example, if a data set consists of 4 observations for the operating margin, say, 1, 2, 4, and 6 percent, the lower quartile is 1.5 percent, the median is 3 percent and the upper quartile is 5 percent. This calculation approach is also supported by the IRS definition of the interquartile range as stated in Regs. 1.482-1(e)(2)(iii)(C).

comparable Automotive Manufacturers pan-European arm's length range, 11.68 percent.

Therefore, each comparables set involves a significant number of statistical tests whereby each individual country's arm's length range is compared to the full pan-European set.<sup>53</sup>

We have used a nonparametric test, the Chi-square test, to perform these interquartile statistical analyses.<sup>54</sup> Nonparametric tests make less stringent assumptions regarding the distribution of the underlying data (i.e., the quartiles of the arm's length ranges) and are therefore more appropriate for these analyses than parametric tests, which do assume a distribution for the underlying sample data. Another major advantage of the Chi-square test is that it is appropriate when the underlying sample sizes are small ( $n < 100$ ), which is the case for most countries in our specific sets.

The Chi-square test draws statistical inference between the medians of two independent samples. In our test, we are effectively calculating the lower and upper quartiles as medians of the relevant distribution, keeping in mind that we are testing the 25<sup>th</sup> percentile and the 75<sup>th</sup> percentile. The Chi-square test is a rank-based method based on the comparison of the number of observations above and below the overall median in each subset. To employ the Chi-square test for quartiles, we slightly modified the structure of our data sets. In a first step we subdivided each country set and the European set into two subsets, each comprising an equal number of observations. All companies below or equal to the median were allocated to the lower subset and all companies above or equal to the median were grouped in the upper subset. In a second step, the Chi-square test was applied to the lower group for testing the equality of the lower quartile and to the upper group for testing the upper quartile.

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<sup>53</sup> An important point to be addressed here is whether the tested country should also be included in the European set against which it is tested. Based on our analytical focus, the answer is clearly yes. The reason for this answer is that we are testing whether a country's mutually exclusive options -- (i) to rely on national data or (ii) to use a pan-European set -- would lead to significantly different results. Because the Pan-European option would include the country's company data, it must be included in our analysis as well.

<sup>54</sup> Conover, W.J. (1980), *Practical Nonparametric Statistics*, 2nd edition, John Wiley & Sons.

The results of these tests are reported in Table 4 below.<sup>55 56</sup>

	<b>Automotive Manufacturing</b>	<b>Electronics Manufacturing</b>	<b>Chemicals Distribution</b>	<b>Electronics Distribution</b>
<b>Size of Data Set (# Companies)</b>	505	748	754	1,386
<b>Profit Level Indicator</b>	<b>Return on Assets (ROA) in %</b>		<b>Operating Profit Margin (OPM) in %</b>	
<b>Interquartile Range Europe</b>	3.62 – 11.69	2.52 – 11.24	1.29 – 4.73	1.17 – 4.97
<b>Lower Quartile – Same as pan-European</b> <i>(Accept null Hypothesis)</i>	Belgium Germany Denmark Finland France UK Greece Netherlands Norway Portugal Sweden	Belgium Germany Denmark Finland France Greece Italy Netherlands Norway Portugal Sweden	Belgium Germany Denmark Finland France UK Greece Italy Netherlands Norway Portugal Sweden	Belgium Germany Denmark Spain Finland France UK Italy Norway Portugal
<b>Lower Quartile – Different than pan-European</b> <i>(Reject null Hypothesis)</i>	Italy (Spain)	UK (Spain)	(Spain)	Sweden (Greece) (Netherlands)

<sup>55</sup> As we have previously indicated, we also tested different assumptions for company size and profit levels against the base case (a minimum of €2 million in sales and a profit level within the range of minus 5 percent to 15 percent for the OPM and minus 10 percent to 20 percent for the ROA). The results and conclusions did not vary significantly. For example, if a minimum of €5 million in sales is assumed, the Netherlands is not significant any more for the upper quartile of Electronics Distribution. If profit level ranges are narrowed further, the identified country deviations typically become less significant.

<sup>56</sup> For the Electronics Manufacturing and Automotive Manufacturing, RTA was considered the relevant profit level, whereas for Chemicals Distribution and Electronics Distribution OPM was used. However, we tested both profit level indicators for both functions and found that identified countries were identical under both indicators (with minor exceptions).

	<b>Automotive Manufacturing</b>	<b>Electronics Manufacturing</b>	<b>Chemicals Distribution</b>	<b>Electronics Distribution</b>
<b>Upper Quartile – Same as pan-European</b> <i>(Accept null Hypothesis)</i>	Belgium Germany Denmark Finland France UK Greece Norway Portugal Sweden	Belgium Germany Denmark Spain France UK Greece Italy Netherlands Norway Portugal Sweden	Belgium Germany Denmark Spain Finland France UK Greece Italy Netherlands Norway Portugal Sweden	Belgium Germany Denmark Spain Finland France UK Italy Norway Portugal Sweden
<b>Upper Quartile - Different than pan-European</b> <i>(Reject null Hypothesis)</i>	Spain (Italy) (Netherlands)	Finland		Greece Netherlands

**Table 4: Results of Inter-quartile Range Tests for the Specific Tests**

The results of the test for equality of interquartile ranges may be interpreted as follows:

- For almost all European countries the lower and upper quartiles of each of the comparables sets were statistically equivalent to the lower and upper quartiles of the pan-European set of comparables.
- Of the total 14 rejections of the null hypothesis in the 104 tests performed, seven (or half of the null rejections) refer to situations in which the profit level indicator of a country is actually within the range of European profit levels. These situations are indicated by parenthesized country names.
- Spain has a significantly different lower quartile in all cases (except for Electronics Distribution), but its lower quartile is always higher than the corresponding European quartile, so that Spain’s lower quartile is always within the European range. In the relevant cases Spanish interquartile ranges are narrower than the corresponding European ranges, supporting the conclusion that

in the relevant cases Spanish company sets are more homogeneous than European company sets.

- When the country quartiles were not equivalent to the pan-European set (e.g., Spain and Italy for Automotive Manufacturing or Greece and Netherlands for Electronics Distribution) it was industry specific.
- The number of statistically different results was always small. For example, in all tests at least 10 of the 13 countries' lower and upper quartiles were statistically equivalent to the pan-European lower/upper quartiles.
- If we focus on situations in which a country's profit level is outside the European range, no country appears to be significantly different in more than just one situation.

### **Summary of the Interquartile Range Tests for Specific Tests**

Our Specific Tests results clearly show that the arm's length ranges for the country-specific comparables sets are statistically equal, to a significant degree, to the arm's length ranges in the pan-European sets. Further, we found no substantial or consistent pattern of deviations when the ranges were not equal. Therefore, there is a high likelihood that a country-specific search and a European search would result in a data set with companies that have the same profit levels. Under the OECD Guidelines, this result provides justification for employing a pan-European comparables set.

### **Supplementary Tests**

We also performed supplementary analyses to the Chi-square analyses to confirm the robustness of our results. These supplementary analyses test the central tendency of the distributions – the median or the mean – rather than the arm's length range quartiles. In this respect, these tests are less powerful but no less relevant than the quartile tests above. Further, the analysis that tests for the equivalence of the means for the country-specific comparables set and the pan-European comparables set is based on the full distribution of profit results rather than the interquartile range of profits; the results of this test should be



viewed with caution, because the mean could be significantly influenced by single data points (i.e., outliers) that lie far outside the arm's length range of profits.

The first supplementary test is an ordinary least squares regression (OLS) test, whereby we tested for the equivalence of the mean level of profits for each country in our sample. For example, we sought to answer the question whether the mean of the French Electronics Distribution set equal the mean of the UK Electronics Distribution set. Equality of the means of the specific-country comparables sets is supportive of a pan-European set of comparables, because it indicates that the country-specific sets are comparable, as required by the OECD Guidelines.

The OLS model is specified with the profit level (operating margin or return on assets) as the dependent variable and country dummy variables as the independent variables.<sup>57</sup> Therefore, this OLS model specification is equivalent to an analysis of variance (ANOVA) test.

In addition to the OLS tests of the means, we also tested the equality of the medians of the comparable ranges for each country compared to the Pan-European set for all four comparables groupings. Again, as with the OLS test, a finding that the medians or the variances were equal is consistent with the assertion that a pan-European set of comparables is the correct approach. The median test employs a Chi-square test, the same methodology as the interquartile test. The results of these tests are summarized in the following table.<sup>58</sup>

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<sup>57</sup> For example, when testing the operating margin of the French Electronics Distributors against Europe, the regression formula has the following form:  $OPM = C + a BE + b DE + c DK + d ES \dots$  C stands for a constant, BE, DE, DK, ES, denote the dummy variables for Belgium, Germany, Denmark, Spain etc., and a, b, c, d etc. stand for the regression coefficients.

<sup>58</sup> When a country has a statistically significant higher (lower) profit level, the country is labeled by a parenthesized "+" ("−").

	<b>Automotive Manufacturing</b>	<b>Electronics Manufacturing</b>	<b>Chemicals Distribution</b>	<b>Electronics Distribution</b>
<b>Size of Data Set (# Companies)</b>	505	748	754	1,386
<b>Regression</b>	Finland (+) France (+) Spain (+)	Finland (+) UK (-)		Greece (+) Netherlands (+)
<b>Median Test</b>	Spain (+) Italy (-) Netherlands (-) Norway (-)	Finland (+) UK (-)		Greece (+)

**Table 5: Results of Supplementary Tests for the Specific Tests**

The results of the supplementary tests for equality of the means, medians, and variances of the country-specific comparables sets may be summarized as follows:

- The OLS regression and the Chi-square median tests are consistent with the results of the interquartile tests. With minor exceptions (France in the Automotive Manufacturing OLS test and Norway in the Automotive Manufacturing median test), there are consistent results of these measures of central tendency with the Chi-square interquartile ranges tests.
- There is no obvious bias or pattern indicating that a particular country is noticeably different from the rest of Europe. Finland is the only country that under some of the tests appears to have higher average profits (labeled by a parenthesized “+” in the table above) for the manufacturing comparables sets. We have not identified any bias in our data that would explain this result.<sup>59</sup> Also, Greece is an exception in Electronics Distribution.

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<sup>59</sup> A Bank of England study on international company profitability speculates that Finland’s unique commitment to R&D and its highly educated workforce are likely to lead to higher financial performance of Finnish companies relative to others in Europe. Finish manufacturers, in other words, employ higher levels of valuable intangibles than manufacturers in the rest of Europe. Of course, our comparable analysis was intended to eliminate companies that had valuable economic intangibles. See Citron, L., Walton, R., (2002), “International Comparisons of Company Profitability,” *Economic Trends* No. 587, 21-34.

### **Summary of the Results for the Supplementary Tests for Specific Tests**

The statistical results for the tests regarding the central tendencies of the arm's length ranges of results (i.e., the mean, median, and variance tests) confirm the results we have obtained from the interquartile tests: that the country-specific ranges are comparable to the pan-European ranges. These results again support the use of pan-European comparables sets.

We will now introduce the Broader Tests based on new comparability analyses procedures to investigate how far the results derived in the Specific Tests can be generalized.

#### ***b. Broader Tests***

To test whether the results of the Specific Tests generalize to the general population of potential comparable companies TNMM ranges, we have performed a number of analyses based on a much broader data set - the Broader Tests. The data is once again from the Amadeus 1,000,000 pan-European database. In contrast to the Specific Tests, which are designed to replicate as closely as possible Deloitte's comparability analysis for the TNMM, the Broader Tests are based on a more relaxed comparability screening criteria. The reason for the relaxation of the comparability criteria in these broad tests is that it requires less effort than is required to perform the comparability analysis for the Specific Tests.

The comparability process for the Broader Tests starts in the same way as for the Specific Tests in that we eliminate dependent companies, start-up companies, companies with insufficient financial data, etc. The geographic markets are also the same as in the Specific Tests (see Table 1). The basis for the further screening in these Broader Tests are the two digit NACE Codes for manufacturing (NACE 15xx – 37xx), distribution (50xx – 52xx) and services (71xx – 74xx).<sup>60</sup> The final set consists of 37,732 companies. The

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<sup>60</sup> In selecting these codes we concentrated on the most relevant industries within Europe. The manufacturers covered by NACE 15xx – NACE 37xx make up almost 90 percent of European production.

following table provides a broad overview of the data, segmented according to functions:<sup>61</sup>

	<b>Manufacturing</b>	<b>Distribution</b>	<b>Services</b>
<b>Included Industries</b>	NACE 15 – 37	NACE 50 - 52	NACE 71 - 74
<b>Size of Data Set (# Companies)</b>	15,405	19,633	3466
<b>Mean Sales (€Thousands)</b>	25,539	23,710	25,253
<b>Profit Level Indicator</b>	ROA in %	OPM in %	NCP in %
<b>Mean</b>	6.2	3.0	5.3
<b>Lower Quartile</b>	2.2	1.0	2.1
<b>Median</b>	5.9	2.3	4.5
<b>Upper Quartile</b>	10.5	4.4	8.0

**Table 6: Summary Overview of Broad Tests Data Sets**

We then narrowed these broad functional categories into more focused functional categories. The refinement of the comparability analyses was performed based on two or three digit NACE codes, with the following selection criteria:

- Relevance for European production and trade;
- National vs. international market area;
- Limited government regulation; and
- Availability of data in the Amadeus database.

The final comparables sets are indicated in the table directly below.

	<b>Publishing &amp; Printing</b>	<b>Machinery Manufacturing</b>	<b>Vehicle Parts Distribution</b>	<b>Food Distribution</b>	<b>Computer Services</b>
<b>Screening Criteria</b>	NACE 22xx	NACE 29xx	NACE 503x	NACE 513x	NACE 72xx
<b>Size of Data Set (# Companies)</b>	740	1,174	426	2,325	786

**Table 7: Screening Criteria for Broad Tests**

<sup>61</sup> We eliminated outliers falling outside the range of minus 10 and 20 percent RTA for manufacturing, minus 5 and 15 percent OPM for distribution, and zero to 15 percent net cost plus (NCP) for services.

Machinery Manufacturing is the industry with the highest trade relevance for Germany, and makes up approximately 10 percent of European production. Vehicle Parts Distribution has been chosen as a complement to Automotive Manufacturing that was presented in the Specific Tests. Printing & Publishing has predominantly national relevance in most European countries, but shareholding in these industries is becoming more and more international. Food distribution is among the largest distribution sectors. Although certain food types are regulated, regulation is becoming increasingly harmonized all over Europe. In respect of services, we regarded computer-related activities as the most relevant field. Computer Service companies make up approximately 20 percent of the service sector in the Amadeus database. Moreover, Computer Services are typically rendered across borders, and regulation usually does not create barriers to entry.

A broad summary of the underlying data used for each country and function can be found in Appendix 3.

### **1. Overview of the Broader Tests Statistical Analyses**

The statistical analyses for the Broader Tests are identical to the analyses previously described in the Specific Tests. Therefore, the difference between the Specific Tests and the Broader Tests is not the statistical analyses performed but rather the comparability analyses applied to obtain the arm's length ranges of results. Because the comparability screening was relaxed in the Broader Tests relative to the Specific Tests, we have assumed that companies that have losses over a three-year average period and companies that have a ROA, OPM or NCP above 15 percent for the three-year average period are not functionally comparable and are therefore eliminated from the arm's length ranges.

The target variables (quartiles, mean, and median) to be tested are the same as in the Specific Tests, and the testing methods and models are identical. We will now explain the results of these statistical analyses for the Broader Tests.

## 2. Interquartile Range Tests for Broader Tests

We performed the Chi-square tests for equality of the 25<sup>th</sup> percentile and the 75<sup>th</sup> percentile to assess the equality of the arm's length ranges based on country-specific data versus the pan-European data.

	<b>Publishing &amp; Printing</b>	<b>Machinery Manufacturing</b>	<b>Vehicle Parts Distribution</b>	<b>Food Distribution</b>	<b>Computer Services</b>
<b>Screening Criteria</b>	NACE 22xx	NACE 29xx	NACE 503x	NACE 513x	NACE 72xx
<b>Size of Data Set (# Companies)</b>	740	1,174	426	2,325	786
<b>Profit Level Indicator</b>	ROA in %	ROA in %	OPM in %	OPM in %	NCP in %
<b>Interquartile Range</b>	3.1 – 9.6	3.6 – 10.1	1.3 – 5.4	0.7 – 3.2	2.8 – 8.8
<b>Lower Quartile – Same as pan-European</b> <i>(Accept null Hypothesis)</i>	Germany Denmark Spain Finland France UK Greece Italy Netherlands Norway Portugal Sweden	Belgium Germany Denmark Spain Finland France UK Greece Norway Portugal Sweden	Belgium Germany Denmark Finland France UK Greece Italy Netherlands Norway Portugal Sweden	Belgium Germany Denmark Spain Finland France Italy Netherlands Norway Portugal Sweden	Belgium Germany Denmark Spain Finland France UK Greece Italy Netherlands Norway Portugal Sweden
<b>Lower Quartile – Different than pan-European</b> <i>(Reject null Hypothesis)</i>	Belgium	Italy (Netherlands)	(Spain)	UK (Greece)	
<b>Upper Quartile – Same as pan-European</b> <i>(Accept null Hypothesis)</i>	Belgium Germany Denmark Spain Finland France Greece Netherlands Norway Portugal Sweden	Belgium Germany Denmark Spain France UK Greece Italy Netherlands Norway Portugal	Belgium Germany Denmark Spain Finland France Greece Italy Netherlands Norway Portugal	Belgium Germany Denmark Finland France UK Italy Netherlands Norway Portugal Sweden	Belgium Germany Spain Finland France UK Greece Italy Netherlands Portugal Sweden
<b>Upper Quartile - Different than pan-European</b> <i>(Reject null Hypothesis)</i>	UK (Italy)	Finland Sweden	Sweden (UK)	Greece (Spain)	(Denmark) (Norway)

**Table 8: Results of Interquartile Range Tests for Broader Tests Data**

Table 8 is structured similar to Table 4 in the Specific Tests section. Here we can see when the country-specific results are statistically equivalent to the pan-European range and when they are not. If a country's results are not statistically equivalent to the pan-European range, but the country's range lies within the pan-European arm's length range, the country's name is parenthesized. Results of the interquartile test are summarized and interpreted as follows:

- No country differs systematically from the pan-European range. For the majority of countries there is either no deviation or just one deviation from the pan-European arm's length results.
- There are eight instances when a country's quartile statistically fell outside the European arm's length range and eight instances when a country's quartile statistically fell within the European arm's length range.
- Industry rather than country seems to be the driving force behind the country quartiles not statistically equivalent to the pan-European quartiles. Countries with two exceptions (such as the United Kingdom) show differing directions of profit levels. For Publishing & Printing, for example, the United Kingdom is above the European range, whereas for Vehicle Parts Distribution it is below.
- Equality of profit levels is most evident for Computer Services. Services like software or hardware consultancy or database management can be rendered independently of a company's location. We suspect that the low barriers to entry into national markets, and the predominantly European-wide competition make this sector a good benchmark for testing the equality hypothesis.

### **3. Supplementary Tests for Broader Tests**

Parallel to the supplementary Specific Tests we also performed supplementary tests based on the broad data set. The supplementary tests focus on the central tendency of profit distributions among countries, rather than just dealing with the equality of quartiles.

Again, the series starts with the regressions and proceeds with the median tests. The results are outlined in Table 9 below:

	<b>Publishing &amp; Printing</b>	<b>Machinery Manufacturing</b>	<b>Vehicle Parts Distributing</b>	<b>Food Distribution</b>	<b>Computer Services</b>
<b>Size of Data Set (# Companies)</b>	740	1,174	426	2,325	786
<b>Regression</b>	Belgium (-) Finland (+) UK (+) Sweden (+)	Italy (-)	France (-) UK (-) Greece (+) Sweden (+)	Spain (-) Greece (+)	
<b>Median Test</b>	Italy (-)	Finland (+) Italy (-)	Sweden (+)	Spain (-) Greece (+)	Norway (-)

**Table 9: Results of Supplementary Tests for Broader Tests Data**

The key conclusions we draw from the supplementary Broader Tests are:

- Equality of means is a stronger but less relevant test than directly testing the equality of the interquartile range boundaries. It is therefore not unexpected that the regression test produces more exceptional cases than the interquartile range tests. However, countries identified in the regression analysis change from industry to industry, suggesting that no country systematically differs.
- The fact that Computer Services and Machinery Manufacturing are the most integrated industries in the set is mirrored by the results.
- Our suspicion, that industry is driving profits rather than country is supported by the supplementary tests. In industries like Publishing & Printing or Food Distribution with country specific market conditions (e.g., consumer preferences) profit distributions are less equal than in purely international industries like Computer Services. A comparability search with an extensive screening process would likely account for such differences and would only consider companies operating under similar market conditions.



- The results of the median test are consistent with the quartiles test. Countries identified here were also exceptional in Table 8.
- We can conclude that a larger data set does not bring about more significant results. For example, the Machinery Manufacturing set is almost three times larger than the Vehicle Parts Distributors set, but its profit distributions tend to be even more equal. This mirrors economic reality. While Machinery Manufacturing is a typical European business, Vehicle Parts Distribution companies are smaller and their market areas tend to be local or regional.

*c. Conclusions Regarding the Empirical Analysis of “Is Europe One Market?”*

The Specific Tests and Broader Tests performed in this section comprise nine broad functions and industries covering approximately 60 percent of European production and related distribution/service activities. In selecting appropriate data sets for our analyses we built on our comparability search practice. Given the practical relevance and the reasonableness of the data sets, we have a high level of comfort in the explanatory power of our analyses.

Our major conclusion from the tests performed is that country is not a driver of results in Pan-European comparability studies. No country shows systematically different profit levels when compared to Europe.

## VI. Conclusion

In this White Paper we have analyzed the important question whether it is appropriate to perform TNMM comparability analysis using a pan-European set of comparable companies, or whether comparables data should be selected on a European country-specific basis. Our economic analysis follows comparability principles articulated in the OECD Guidelines and standard comparability analyses processes. We have performed rigorous statistical comparisons of the arm's length results for groups of functionally comparable companies based on pan-European versus country-specific comparables sets. Our TNMM comparables data include both close functionally comparable data sets and broad functionally comparable data sets. We test all common attributes of the arm's length ranges, including the lower and upper quartiles, mean, and median using the most common, relevant profit level indicators for the given comparables data sets. Our statistical results strongly support the conclusion that arm's length ranges for comparable companies do not statistically differ by country in Europe. Specifically, out of the 234 tests conducted testing the statistical equality of upper and lower quartiles of arm's length ranges, 219 tests (approximately 94 percent of the tests) generate results supporting the equality of interquartile ranges. Therefore, we conclude that Europe is one market for TNMM transfer pricing purposes, and that an arm's length range of results based on a pan-European set of comparable companies provides a reliable measure of an arm's length results.

In addition to the statistical results supporting the conclusion, there are also noneconomic reasons why pan-European comparables searches may be preferable in certain situations. Some of the more compelling reasons include:

- Reduced taxpayer compliance burden from avoiding duplicative country-specific TNMM searches;
- Reduced tax authority audit burden from avoiding auditing country-specific TNMM arm's length ranges and inconsistent transfer pricing documentation reports;

- Consistent with approaches taken by taxpayers in other integrated markets, such as the United States, where pan-U.S. data is ordinarily used;
- Greater harmonization of the taxpayer's internal transfer pricing systems in Europe, when the system is based on European third-party comparables data; and,
- Reduced potential for conflicts in European Arbitration and Competent Authority proceedings.

## Appendix 1: Description of Amadeus 1,000,000 Database

The financial data for the Amadeus 1,000,000 version as provided by Bureau van Dijk is sourced from various local information providers, with the following main sources:

<b>aida</b>	45,000 Major Italian companies (Information Provider: Novcredit, Milan, Italy)
<b>amadeus</b>	A pan-European database of over 150,000 companies in 26 European countries
<b>Bnb-nbb</b>	All companies incorporated under Belgian law (185,000 companies) (Information Provider: Banque Nationale de Belgique, Centrale des Bilans, Brussels, Belgium)
<b>dafne</b>	20,000 Major German Companies (Information Provider: Creditreform, Neuss, Germany)
<b>diane</b>	380,000 Major French Companies (Information Provider: SCRL, Lyon, France)
<b>fame</b>	300,000 Major British Companies (Information Provider: Jordans, London, UK)
<b>reach</b>	350,000 Dutch Companies, 5,000 of which appear in detailed format. (Information Providers: Delwel, s'-Gravenhage, Netherlands)
<b>sabe</b>	100,000 Major Spanish Companies (Information Provider: Informa SA)

## Appendix 2: Description of Specific Tests Data

Automotive Manufacturing								
Industries	Countries	BE	DE	DK	ES	FI	FR	UK
Rev > 2.0 million -10% < RTA < 20%	Number of Co's	8	2	3	134	28	126	54
	% of Total	1,58%	0,40%	0,59%	26,53%	5,54%	24,95%	10,69%
	Mean Revenue	23.143	14.413	18.175	9.133	8.774	6.711	23.823
		<b>GR</b>	<b>IT</b>	<b>NL</b>	<b>NO</b>	<b>PT</b>	<b>SE</b>	<b>EUROPE</b>
	Number of Co's	2	41	20	11	19	57	505
	% of Total	0,40%	8,12%	3,96%	2,18%	3,76%	11,29%	100,00%
Mean Revenue	3.565	27.228	25.866	7.105	6.885	8.298	12.263	
Electronics Manufacturing								
Industries	Countries	BE	DE	DK	ES	FI	FR	UK
Rev > 2.0 million -10% < RTA < 20%	Number of Co's	7	24	7	118	41	322	104
	% of Total	0,94%	3,21%	0,94%	15,78%	5,48%	43,05%	13,90%
	Mean Revenue	18.500	22.231	22.556	6.836	9.355	7.046	12.838
		<b>GR</b>	<b>IT</b>	<b>NL</b>	<b>NO</b>	<b>PT</b>	<b>SE</b>	<b>EUROPE</b>
	Number of Co's	4	33	11	10	12	55	748
	% of Total	0,53%	4,41%	1,47%	1,34%	1,60%	7,35%	100,00%
Mean Revenue	4.914	20.818	26.614	9.887	5.352	8.518	9.773	
Chemicals Distribution								
Industries	Countries	BE	DE	DK	ES	FI	FR	UK
Rev > 2.0 million -5% < OPM < 15%	Number of Co's	14	2	1	164	14	79	2
	% of Total	1,86%	0,27%	0,13%	21,75%	1,86%	10,48%	0,27%
	Mean Revenue	31.458	5.809	11.474	8.685	14.321	12.731	10.690
		<b>GR</b>	<b>IT</b>	<b>NL</b>	<b>NO</b>	<b>PT</b>	<b>SE</b>	<b>EUROPE</b>
	Number of Co's	5	439	2	3	3	26	754
	% of Total	0,66%	58,22%	0,27%	0,40%	0,40%	3,45%	100,00%
Mean Revenue	9.139	14.807	35.957	4.453	5.905	16.358	13.503	
Electronics Distribution								
Industries	Countries	BE	DE	DK	ES	FI	FR	UK
Rev > 2.0 million -5% < OPM < 15%	Number of Co's	1	3	0	82	128	787	111
	% of Total	0,07%	0,22%	0,00%	5,92%	9,24%	56,78%	8,01%
	Mean Revenue	17.573	71.558	n.a.	15.928	9.223	8.475	16.270
		<b>GR</b>	<b>IT</b>	<b>NL</b>	<b>NO</b>	<b>PT</b>	<b>SE</b>	<b>EUROPE</b>
	Number of Co's	26	27	41	17	19	144	1.386
	% of Total	1,88%	1,95%	2,96%	1,23%	1,37%	10,39%	100,00%
Mean Revenue	7.304	27.624	24.447	14.836	15.682	9.388	10.847	

### Appendix 3: Description of Broad Tests Data

Total Set (NACE 15xx - 37xx, NACE 50xx - 52xx, NACE 71xx -74xx)								
Countries		BE	DE	DK	ES	FI	FR	UK
Rev > 2.0 million -10% < RTA < 20%	Number of Co's	1.269	169	185	6.684	430	15.707	5.203
	% of Total	3,36%	0,45%	0,49%	17,71%	1,14%	41,63%	13,79%
	Mean Revenue	20.791	43.930	35.142	18.516	42.621	20.053	43.834
		GR	IT	NL	NO	PT	SE	EUROPE
	Number of Co's	1.032	2.745	168	1.754	651	1.735	37.732
	% of Total	2,74%	7,27%	0,45%	4,65%	1,73%	4,60%	100,00%
Mean Revenue	10.882	27.580	135.805	11.444	21.762	29.976	24.633	
Manufacturing (NACE 15xx - 37xx)								
Countries		BE	DE	DK	ES	FI	FR	UK
Rev > 2.0 million -10% < RTA < 20%	Number of Co's	419	81	48	2.724	182	6.036	2.251
	% of Total	2,72%	0,53%	0,31%	17,68%	1,18%	39,18%	14,61%
	Mean Revenue	17.874	41.702	28.527	22.703	40.591	24.075	32.217
		GR	IT	NL	NO	PT	SE	EUROPE
	Number of Co's	494	1.635	70	422	277	766	15.405
	% of Total	3,21%	10,61%	0,45%	2,74%	1,80%	4,97%	100,00%
Mean Revenue	9.564	25.720	99.290	14.741	26.089	32.385	25.539	
Distribution (NACE 50xx - 52xx)								
Countries		BE	DE	DK	ES	FI	FR	UK
Rev > 2.0 million -5% < OPM < 15%	Number of Co's	697	64	110	3.664	247	8.728	1.931
	% of Total	3,55%	0,33%	0,56%	18,66%	1,26%	44,46%	9,84%
	Mean Revenue	21.792	55.507	35.215	15.979	43.265	17.321	62.972
		GR	IT	NL	NO	PT	SE	EUROPE
	Number of Co's	514	964	87	1.410	352	865	19.633
	% of Total	2,62%	4,91%	0,44%	7,18%	1,79%	4,41%	100,00%
Mean Revenue	12.916	30.901	183.145	10.285	19.859	28.479	23.710	
Services (NACE 71xx - 74xx)								
Countries		BE	DE	DK	ES	FI	FR	UK
Rev > 2.0 million 0% < OPM < 15%	Number of Co's	159	29	21	362	44	1.399	945
	% of Total	4,59%	0,84%	0,61%	10,44%	1,27%	40,36%	27,26%
	Mean Revenue	26.163	18.349	33.207	16.703	28.411	17.641	36.768
		GR	IT	NL	NO	PT	SE	EUROPE
	Number of Co's	26	135	15	99	28	204	3.466
	% of Total	0,75%	3,89%	0,43%	2,86%	0,81%	5,89%	100,00%
Mean Revenue	9.363	27.526	49.155	13.914	9.756	24.809	25.253	