Do Multinationals Use Water and Energy Relatively Efficiently in Malaysian Manufacturing?

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Abstract

This paper examines water and energy efficiency differentials between foreign multinational enterprises (MNEs) and local plants in Malaysian manufacturing using data on medium-large plants from the industrial census for 2000 and sample surveys for 2001-2004. Both descriptive statistics and results of econometric estimation indicate that MNEs had a moderate tendency to use relatively little fuel, which was relatively dirty source of energy during this period in Malaysia. MNEs also had a weak tendency to have high electricity intensities as well as low total energy and water intensities. However, differences in energy and water intensities between MNEs and local plants were not very pervasive or consistent over time, suggesting that both MNEs and local plants generally used energy and water with similar efficiency.

Keywords: multinational enterprise, energy and water efficiency, Malaysia, manufacturing
JEL Categories: F23, L60, O53, Q40
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1. Introduction

This paper uses plant-level data to investigate whether foreign multinational enterprises (MNEs) used two types of energy (electricity and fuel) and water more efficiently than local plants in Malaysian manufacturing in 2000-2004. In a similar study, Eskeland and Harrison (2003, p. 21) found that "foreign plants are significantly more energy efficient and use cleaner types of energy" than their local peers in Coˆte d'Ivoire, Mexico, and Venezuela. In a related study of provincial data, He (2006) provides evidence that FDI enterprises produce "with higher [SO2] pollution efficiency", but that stronger environmental regulation has simultaneously, though moderately, deterred FDI among Chinese provinces. Earnhart and Rizal (2006) focus on the effects of financial performance and privatization on environmental performance, but their results indicate foreign ownership was usually an insignificant determinant of pollution in Czech firms. The study of Malaysia is of interest because its manufacturing data are relatively rich and allow relatively rigorous analysis, and because it is a middle-income economy with substantial manufacturing sector and large foreign MNE presence in manufacturing and other sectors of the economy.

These analyses are important because energy consumption generates a large portion of air pollution emitted by manufacturing plants and water use is often correlated with water depletion and pollution. Improving energy and water efficiency, or conserving energy and water, is thus an important way to limit pollution by manufacturers. For example, if foreign MNEs are more efficient than local plants or firms in host economies as often asserted, they may contribute directly to greater resource efficiency and lower pollution intensity in the host and may also help create spillovers that encourage local plants and firms to adopt resource-saving technologies. In Malaysia, electricity is also a relatively clean energy source compared to fuel consumption, which is mainly oil. Thus, it is also meaningful to ask if MNE-local differentials in energy intensities vary among relatively clean and dirty energy sources.

The paper first reviews literature related to the resource efficiency of MNEs (Section 2) and describes the database used (Section 3). It then compares resource expenditures and resource intensities between MNEs and local plants (Section 4), and analyzes whether MNE-local differentials persist after accounting for other factors that may affect these intensities (Section 5). A methodology similar to that described in Eskeland and Harrison (2003, pp. 16-18) is adopted for this purpose. Section 6 concludes.

2. MNEs and Resource Efficiency in Developing Economies

There are at least two distinct stands of literature examining the environmental impacts of MNEs in developing economies. One examines location choices of MNEs and investigates the so-called pollution-haven hypothesis, asking whether relatively lax environmental standards in developing economies encourage MNEs to locate "dirty" production in those economies. Although this literature's methodology differs from that used in this paper, it is helpful to review a few key concepts raised by this literature. There is also a substantial literature which examines whether foreign MNEs are more efficient than local plants in developing economies, which is more directly related to this analysis of how efficiently specific resource inputs are used.

2a. Pollution Havens and Location Choice by MNEs

The pollution haven hypothesis literature is worthy of brief consideration because it helps put this analysis in the context of other literature on MNEs and the environment. The pollution haven hypothesis states that MNEs transfer polluting activities from home economies where environmental regulations are relatively strict to developing economies where corresponding regulations tend to be less stringent. Evidence supporting this pollution-haven hypothesis is generally weak (Dean et al. 2009; Eskeland and Harrison 2003; Kirkpatrick and Shimamoto

2008; Smarzynska and Wei 2001), but there is some evidence consistent with the hypothesis (He 2006; Wagner and Timmons 2008).

These analyses face numerous problems which have yet to be sorted out. First, internationally comparable and meaningful data on location choice by MNEs and the severity of environmental regulations are not easy to obtain. For example, the level of foreign direct investment (FDI) is often used to proxy MNE location choice, but FDI represents only a portion of equity and loans (corporate finance) in recipient affiliates and is often poorly correlated (both over time and across economies) with employment, sales, and other real activities in recipient affiliates (Ramstetter 2012). Measuring the stringency of environmental regulation is also notoriously difficult. Second, modeling MNE location choice is a rather imprecise art and most of the literature lacks sufficient data to analyze the effects of all potentially important determinants (Ramstetter 2011). For example, Kirkpatrick and Shimamoto (2008) find a positive correlation between Japanese firm presence and host country participation in international environmental agreements, but fail to account for other factors related to good governance (e.g., strong and impartial legal and political institutions, effective economic policy implementation), which are likely to be positively correlated with participation in international environmental agreements. In other words, the analysis omits key institutional determinants of MNE location choice and this omission has a strong potential to bias estimates of the effects of environmental regulation.

Even if the pollution-haven hypothesis is true, and foreign direct investment (FDI) or other MNE activities (e.g., employment, sales) tend to be concentrated in pollution-intensive industries and countries with relatively lax environmental regulation, MNE affiliates in developing economies may also be less pollution- or resource-intensive compared to local firms or plants. In other words, even if MNEs exploit pollution havens, they may contribute to more efficient use of resources or reduced pollution in host developing countries, especially if resource-efficient practices in MNEs spillover to local firms.

2b. MNEs, Productivity, and Resource Efficiency in Developing Economies

In recent years, theoretical analyses have highlighted the role of what have been called knowledge-based, intangible assets (terminology from Markusen 1991) in MNEs. The key goals of many theoretical analyses are to explain why the MNE chooses to invest abroad when it (at least) initially has several cost disadvantages compared to local firms, and why the MNE chooses to spread out production across countries rather than concentrate it in one location. Most observers agree that MNEs tend to possess relatively large amounts of technological knowledge and networks, marketing expertise and networks, especially international ones, and generally have relatively sophisticated and capable management.[1] The first two characteristics are evidenced by relatively high research and development (R&D) intensities (ratios to total sales), relatively large proportions of patent applications and approvals, relatively high advertising-sales ratios, and relatively high dependence on international trade (generally on both exports and imports). Correspondingly, when asking what makes a firm decide to assume the extra costs of investing in a foreign country (compared to the costs of local firms in the host), Dunning (1988) asserted that a firm must first have "ownership advantages" such as those afforded by possession of relatively large amounts intangible assets, as well as "location advantages" and "internalization advantages" before investing.[2]

The important implication is that, if one accepts the idea that MNEs have relatively large amounts of knowledge-based, intangible assets, MNEs will tend to be relatively efficient producers compared to non-MNEs, at least in some respect. And this relatively high efficiency could involve the MNE becoming more resource efficient and/or polluting less as

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[1] Caves (2007) and Dunning and Lundan (2008) provide thorough literature reviews. The work of Markusen (2002) has also been influential.

[2] Dunning's OLI (ownership-location-internalization) paradigm has been influential, but others (Buckley and Casson 1992, Casson 1987, Rugman 1980, 1985) emphasize that the concept of internalization alone can explain the existence of the MNE and its characteristics described here.

part of efforts to facilitate increased demand among consumers and minimize production costs related to energy and pollution abatement needs. Moreover, because MNEs tend to be relatively R&D- and patent-intensive, and because technologies for clean energy and pollution control often require relatively sophisticated technological inputs, it is logical to expect that MNEs are relatively efficient producers and consumers of goods and services that promote resource efficiency and pollution reduction. For example, evidence from Cole et al. (2006) suggests that Japanese firms with outward FDI tend to have better environmental performance (pollute less and manage emissions better) than Japanese firms without outward FDI. This finding is consistent with the notion that MNEs are both better able to and more highly motivated to pollute less than non-MNEs in home economies.[3]

Although limited, most of the existing literature on resource efficiency focuses on energy intensities and indicates that MNEs tend to be relatively energy efficient or pollute less, than local counterparts (see introduction). On the other hand, even if MNEs use less energy per unit of output (i.e., they are more energy efficient), MNEs may contribute to higher energy-related pollution volumes if their production levels and energy use are higher with large MNE presence than with relatively low MNE presence, for example. Water expenditures are usually much smaller than energy expenditures and have not been analyzed in previous studies as far as we know. However, water is a resource input like energy and its use can be analyzed similarly.

As mentioned above, the fact that MNEs can move productive resources internationally clearly gives them the opportunity to locate polluting activities where related regulations tend to be relatively lax. Correspondingly, lax host economy regulation could conceivably give MNEs an incentive to be less resource efficient or pollute more than local firms in host economies. However, this seems unlikely unless there are ownership-related biases in

[3] Cole et al. (2006) also provide evidence that firms with trade are also more likely to have better environmental performance than firms without trade. Correspondingly, they emphasize that internationalized firms are more likely to have better environmental performance than others.

policies or their implementation (i.e., unless host regulation of MNEs is laxer than corresponding oversight of local firms). Moreover, with some exceptions, the existing literature suggests that there the evidence supporting the pollution haven hypothesis is relatively weak.

Although, the theoretical rationale for expecting MNEs to have relatively high productivity is rather convincing, the empirical evidence on productivity differentials between foreign MNEs and local firms in developing economies (which are predominantly non-MNEs) is ambiguous. For example, studies of productivity differentials between foreign MNEs and local non-MNEs in the manufacturing sectors of Malaysia (Oguchi et al 2002, Haji Ahmad 2010), Thailand (Ramstetter 2004, 2006), and Vietnam (Ramstetter and Phan 2008, 2011) suggest that differentials tended to be relatively small and were often statistically insignificant in Thailand and Vietnam. Other evidence from Malaysia (Menon 1998, Oguchi et al. 2002) indicates that the growth of total factor productivity (TFP) was often less rapid in MNEs than non-MNEs. The only known evidence for China also suggests significant differences in both capital- and labor-productivity when all manufacturing firms are combined into one sample (Jefferson and Su 2006). Importantly, the evidence from Malaysia and other Southeast Asian economies cited above suggests that estimates are particularly sensitive to the degree of aggregation, with significant MNE-local productivity differentials becoming infrequent when samples are disaggregated into relatively narrowly defined industry groups with similar products and technologies.

Most previous studies of production efficiency have focused on evaluation of MNE-local differentials in total factor productivity or labor productivity. Although related, this study differs by focusing on the efficiency of input usage, in particular MNE-local differentials in energy and water intensities, where resource intensities are the inverses of average resource productivities with production measured as output (value added plus intermediate expenditures).[4] As far as we know,

[4] Average productivities (e.g., of capital and labor) are usually measured as ratios of value added to the input used, but if resources and other intermediate expenditures are considered to be factors of production, it is more appropriate to measure production as output.

this is one of the first studies to examine these issues in a middle-income, Asian economy.

3. The Data and Patterns of Energy and Water Intensities

This study employs the micro data underlying Malaysia's census of manufacturing plant activity for 2000 (Department of Statistics 2002) and smaller surveys of stratified samples for 2001-2004 (Department of Statistics various years). If samples are limited to plants with viable basic data (i.e., positive values of paid workers, output, worker compensation, and fixed assets), there were 18,799 plants in the 2000 census, but samples were 30-37 percent smaller in 2001-2004.[5] However, most of the difference between the census and survey samples results from the census' inclusion of very small plants with limited production. For example, if samples are limited to medium-large plants with 20 or more employees and viable basic data the census contained only 8,540 plants and the surveys 7,406 to 7,581 plants.

Three types of ownership are identified in the Malaysian manufacturing data, majority-local, 50-50 joint ventures, and majority-foreign. In this study, MNEs are thus defined rather narrowly as plants with foreign ownership shares of 50 percent or more.[6] MNEs are predominantly medium-large plants and medium-large plants differ from small, predominantly local plants in important ways. Thus, it is more meaningful to compare MNEs and non-MNEs in samples of medium-large plants than to include all plants in such comparisons. And although medium-large plants only comprised 56 percent of all plants meeting the above criteria, they accounted for the 98 percent of their production (measured as gross output) and identical shares of expenditures on energy or water in 2000-2004. Thus, focusing on the sample of medium-large plants excludes very little production or expenditures on energy and water. In addition, a focus on medium-large plants has the important advantage of removing most outliers from the samples.

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5 Unless indicated otherwise, see the Appendix Tables 1a-1j for the details cited in this and the following two paragraphs.

6 Malaysian data thus differ somewhat from those for other countries (e.g., Indonesia, Thailand, and Vietnam) because minority-foreign plants (e.g., those with foreign ownership shares of 10 percent or more) are usually defined as MNEs.

When analyzing pollution related issues, it is important to recognize that 12 industries comprising 15 2-digit categories accounted for an average of 93 percent of energy expenditures and 91 percent water expenditures by Malaysia's medium-large manufacturing plants in 2000-2004 (Table 1).[7] Both of these shares were somewhat larger than these industries' corresponding share in manufacturing output (87 percent). In other words, ratios of expenditures on energy or water to gross output (i.e., energy and water intensities) tended to be relatively high in these 12 industries (Table 2). Conversely, both absolute expenditures on energy and water as well as energy and water intensities were smaller in the remaining eight 2-digit categories. This paper focuses primarily on the analysis of the 12 large resource using industries because they are likely to be the largest source of energy and water-related degradation or pollution caused by Malaysian manufacturing. Large energy using industries accounted for even larger shares of MNE output (an average of 93 percent). In other words, MNE shares of gross output were also relatively large in the large energy using industries (54 percent) which are the focus here, compared to smaller energy users (26 percent).

On the other hand, Table 1 indicates that MNE shares of expenditures on energy (36-42 percent) and water (29 percent in 2000 and 45 percent thereafter) were often lower than corresponding shares of output (Table 1). In other words, if calculated as the ratio of the sum of energy and water expenditures, respectively, to output, energy and water intensities were lower in MNEs than in local plants in these 12 industries. However, if calculated as the mean of energy and water intensities among plants in each of the 12 industries, and then averaged over the 12 industries as in Table 2, mean water intensities were slightly higher in MNEs than local plants in 2001-2002 and 2003-2004 (by 0.004-0.005 percentage points), but substantially lower in the census year 2000.[8] Mean energy intensity differentials were also substantially lower in absolute value in the latter two periods (-0.2 to

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[7] In this paper, most of these industries (9 of the 12) are defined at the 2-digit level of the Malaysia Standard Industrial Classification (MSIC), two (rubber and plastics) are the 3 digit components of a single 2-digit category and one (electronics-related machinery) is a combination of four closely related 2-digit categories.

[8] At the industry-level, this calculation weights large and small plants identically as in the regression analysis to follow. The 12-industry mean is an approximation of this procedure that weights each industry equally, after plants are weighted identically within each industry.

-0.3 percentage points) than in the census year 2000 (-1.1 percentage points). As indicated above, energy intensities were considerably larger than water intensities (e.g., a mean of 3.6-4.0 percent versus 0.20-0.25 percent for MNEs in the 12 large resource using industries).

Because energy and water requirements differ markedly among manufacturing industries, it is more meaningful to examine industry-level calculations than 12-industry means. For example, electronics-related machinery is a large portion of Malaysian manufacturing and is dominated by MNEs. MNEs in this industry were characterized by relatively low energy intensities (Table 2). Primarily because of its large size, the industry accounted for 17 percent of all energy expenditures by medium-large plants, but this was under half of its output share, 39 percent (Appendix Tables 1a, 1d). In contrast, shares of energy expenditures were much larger than output shares in paper (13 vs. 7 percent), non-metallic minerals (13 vs. 3 percent), and basic metals (10 vs. 4 percent), resulting in relatively high energy intensities in these industries. The share of electronics-related machinery in water expenditures were larger than in energy expenditures (23 percent), but still much smaller than the corresponding output share, which is reflected in relatively low water intensities in the industry. On the other hand, water intensities were particularly high among MNEs in textiles and rubber.

For the census year, the industry-level data suggest that MNEs had lower energy and water intensities than local plants in most industries (9 or 10 of 12, respectively) in 2000 but that this was true in about half of the industries (5-7) in 2001-2002 and 2003-2004 (Table 2). Relatively large, negative differentials (less than -0.2 percentage points for energy intensities or -0.02 percentage points for water intensities) were slightly more common than correspondingly large positive differentials (greater than 0.2 or 0.02 percentage points, respectively).[9] In short, these industry-level statistics suggest that foreign ownership appears to have a relatively weak relationship with energy or water efficiency in Malaysian manufacturing plants.

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[9] For energy intensities, relatively large, negative differentials outnumbered relatively large, positive ones 8 to 1 for 2000 and 7 to 4 in 2001-2002, but were equal (5 each) in 2003-2004. For water intensities, relatively large, negative differentials were also much more common than relatively large positive ones in 2000 (8 to 1), but that their frequencies were similar in 2001-2002 (5 and 6, respectively) and in 2003-2004 (4 and 3, respectively).

The aggregate energy intensities in Table 2 do not reflect the important possibility that MNEs and local plants may consume different energy mixes and thus impart different environmental impacts even if aggregate energy intensities are similar. For example, Eskeland and Harrison (2003) suggest that electricity consumption is cleaner than fuel consumption and find that MNEs tend to consume relatively more electricity than non-MNEs. In Malaysia during this period, this proposition seems warranted because electricity generation relied mainly on relatively clean fuels such as natural gas and hydropower. The combined shares of these clean fuels in electricity generation were also much larger than corresponding shares of the primary energy supply in 2000 and 2005. On the other hand, the shares of coal (a relatively dirty fuel) were also much larger than corresponding shares of the primary energy supply and coal's share of electricity generation increased substantially toward the end of the period under study.[10] In short, the dominance of gas and hydropower suggests that electricity was indeed a relatively clean source of energy in Malaysia in the earlier years covered by this study, but increases in the use of coal suggests that differences between electricity and fuel consumption became less pronounced toward the end of the period.

Electricity accounted for the majority of energy expenditures in medium-large manufacturing plants in most industries (Table 3). These data also suggest that MNEs had substantially lower fuel intensities than local plants (differentials of less than -0.1 percentage points) in 8-9 of the 12 large energy consuming industries. Conversely, electricity intensities were generally larger in MNEs than local plants, but relatively large MNE-local differentials in electricity intensities (greater than 0.2 percentage points) were observed in only about half (6-7) of the 12 industries in 2001-2002 and 2003-2004 and one-fourth (3) in 2000. In short, these descriptive statistics suggest that the MNE-local differentials were more pervasive and relatively large for fuels compared to electricity,

[10] According to Asia Pacific Energy Research Centre (2009), the combined share of natural gas and hydropower in electricity generation were 88 percent in 2000 and 69 percent in 2005. Corresponding shares of final energy demand were only 48 and 47 percent, respectively. On the other hand, coal's share in electricity generation rose from 7 percent in 2000 to 27 percent in 2005, while its share in the primary energy supply was 3 and 10 percent, respectively. Oil accounted for another large portion of the primary energy supply (43 and 39 percent, respectively) but a very small portion of electricity generation (6 and 4 percent, respectively).

overall energy (which is predominantly electricity), or water in Malaysian manufacturing. However, these industry-level comparisons may mask important plant-level differences and may not adequately reflect the influences of variation in scale and factor intensities can have on energy or water intensities.

4. Water and Energy Intensities and Ownership after Accounting for Scale and Factor Usage

This section attempts to examine the relationship between ownership and energy or water intensities after accounting for the effects of scale and other factor usage by estimating a model similar to that in Eskeland and Harrison (2003, 16-18). The models are derived by differentiating "a translog approximation to a production function" (p. 16) with respect to the energy input in question and interpreted as "inverse input demands" (p. 16). As a result, energy intensities are a function of the logs of other factor inputs (other intermediate consumption [mainly materials and parts], fixed assets, and labor), the log of the quantity of electricity (a proxy for the quantity of energy corresponding to the energy intensity being estimated), and factors related to a plant's technological sophistication. Unfortunately, the Malaysian data do not include information on the quantity of energy or water consumed so this variable must be omitted.[11] In the Malaysian data, there are two potentially important indicators of technological sophistication, the ratio of research and development (R&D) expenditures to gross output and the share of highly educated workers in the total workforce. Because correlations among these two indicators are surprisingly low, both are included in the model.[12] The effect of plant ownership is then captured by adding dummy variables that identify various groups of MNEs and SOEs (i.e., private firms are used as the reference group).

[11] If energy or water prices were equal for all plants, the value variable could be used instead, but assuming this is unrealistic because prices vary among plants depending on energy or water mix, quantities consumed, and the timing of consumption (especially important for electricity and piped gas prices).

[12] In addition, Eskeland and Harrison (2003) also include machinery imports and plant vintage as indicators of plant sophistication, but they are not available in the Malaysian data set.

The resulting model for a cross section of i=1…n and t=3 or 5 years (2000-2004, 2000-2002, and 2002-2004) years is:

$$EP_{it}=a0+a1(LE_{it})+a2(LK_{it})+a3(LM_{it})+a4(ES_{it})+a5(RD_{it})+a6(DF_{it}) \quad (1)$$

where
DF_{it}=a dummy equal to 1 if plant i, year t is an MNE, 0 otherwise
EP_{it}=energy (or water) intensity in plant i, year t (percent)
ES_{it}=share of workers with tertiary education in all workers in plant i, year t (percent)
LE_{it}=natural log of the number of workers in plant i, year t
LK_{it}= natural log of the fixed assets less depreciation at yearend in plant i, year t (ringgit)
LM_{it}=natural log intermediate expenditures excluding energy (or water) in plant i, year t (ringgit)
RD_{it}=ratio of R&D expenditures to gross output in plant i, year t (percent)

If the coefficient *a6* is negative, for example, it would mean that MNEs had significantly lower energy intensities after accounting for the influences of scale and other factor usage, and the two indicators of technological sophistication (the share of technical workers and R&D intensities).

Because all slope coefficients are likely to differ across industries (reflecting the heterogeneity of energy requirements among industries), the emphasis is on analysis of regressions performed at the industry level. However, in petroleum products samples were very small so industry-level estimation is omitted in this case. These results are then compared regressions for all 11 (excluding petroleum products) or 12 (including petroleum products) major polluting industries combined. Because the industry definitions used in this paper are rather aggregate, detailed industry differences in intercepts are allowed for by adding industry dummies at the 3-digit level.[13] State dummies are also included as practical to account for the effects of plant location on its energy intensity.[14] Because the data

[13] A few of the 2-digit industries are also 3-digit categories. It is common to use more detailed dummies at the 4- or 5-digit level, for example. However, this results in a large number of industry categories and with very few or no MNEs in them. Because this level of disaggregation can make it difficult to interpret the signs on ownership variables (the focus of attention here), more aggregate, 3-digit definitions are used to insure that each industry contains at least 5 or more MNEs.
[14] The lack of observations makes it necessary to combine some states when performing some of the industry-level estimates. In such cases, states with similar population densities and nearby locations are combined.

cover a five-year period during which Malaysia experienced a pronounced downturn (2001) and recovery (2002), estimates are performed for 3 periods, the entire period, and two overlapping periods 2000-2002, and 2002-2004 in order to examine if observed MNE-local differentials are consistent over time. Year dummies are also included to further account for differences in intercepts over time. Results of pooled estimates and random-effects panel estimates are also compared to see if observed differentials are robust to the estimation method. When results differ among method, the random-effects estimates are the focus because results of the Breusch and Pagan Lagrangian multiplier test for random effects indicated that null hypothesis of random effects could be rejected in all samples examined, usually at the 1 percent level or better (Appendix Tables 4-5). Fixed effects panel estimates are not meaningful when investigating MNE-local differentials because ownership is itself a fixed effect for most plants.[15] All estimates use robust standard errors (clustered by plant for random effects estimates) to account for potential heteroscedasticity.

Table 4 presents results of estimating 3 types of energy intensities (total, electricity, and fuel) and water intensities for all 12 large energy using industries combined. In general, the model in equation (1) did a better job of explaining variation in total energy and fuel intensities (R-squared between 0.22 and 0.28) than in electricity intensities (R-squared between 0.11 and 0.18) or water intensities (R-squared between 0.05 and 0.07). Coefficients on labor and capital were always positive and highly significant at the 1 percent level, indicating that these factors were complements to energy or water in the production. On the other hand, coefficients on intermediate expenditures excluding the fuel or water input in question were negative and highly significant, indicating substitution with energy or water. The skilled-labor variable was also positive and highly significant in estimates for total energy, electricity, and water, but not for fuel. On the other hand the R&D intensity was insignificant in all random effects estimates and most pooled estimates. Overall, the model in equation (1) performed more or less as expected in plant-level samples such as these, both when all

[15] As a result, fixed effects estimates only reveal the effects of changes in ownership, not ownership-related differences in energy or water intensities between all MNEs and local plants. This is of course another interesting question, but not the focus of this analysis.

large energy consuming industries were combined and in most industry level samples (see Appendix Tables 4 and 5 for other estimation details). However, the model performed relatively poorly when used to estimate water intensities.

In the 12-indutry sample, the coefficient on the MNE dummy was generally positive in estimates of total energy intensities and electricity intensities and generally negative when fuel or water intensities were estimated (Table 4). However, these coefficients were often insignificant, especially when the more meaningful, random effects estimator was used. For example, in the electricity intensity equation, the MNE dummy coefficients were always positive and significant at standard levels (5 percent or better) when the pooled estimator was used but insignificant in 2000-2002 and only weakly significant at the 10 percent level or better in 2000-2004 when the random effects estimator was used. Likewise this coefficient was negative and highly significant (at the 1 percent level or better) in the pooled estimates of fuel intensities but never significant in the random effects estimates. Given the opposite signs of MNE-local differentials for electricity and fuel, it is not surprising that differentials for total energy were never significant at standard levels (though they were weakly significant for 2002-2004). Estimates of water intensities were less sensitive to estimation method, but indicated that differentials changed from significantly negative in the early period to insignificantly positive in the latter period.

Table 5 presents results of industry-level estimates of MNE-local differentials for 11 of the 12 large energy consuming industries. As previously indicated, the petroleum products industry is excluded because its samples were relatively small and unreliable. Table 5 also presents estimated differentials for 11 industries combined, for the sake of comparison. Not surprisingly, results for these 11 industries combined do not differ greatly from results for the full 12 industry sample. However, the industry-level results reveal substantial variation among industries, in addition to substantial differences among estimation methods and period covered. Closer examination of the estimates also reveals substantial variation of other slope coefficients industries (Appendix Table 5). In short, the results suggest substantial heterogeneity in energy and water demand functions among industries. Thus, it is probably more meaningful to focus on the industry-level results in Table 5 than the results for 11- or 12-industries combined in Tables 4-5.

At the industry level, the most striking result is the weakness and of the relationship between energy and water intensities on the one hand, and MNE ownership on the other, and its relatively large variation among industries, periods, and estimation techniques (Table 5). Coefficients were consistently significant in both time periods and both estimation methods at standard levels (5 percent or better) in only one case; indicating that MNEs had substantially lower fuel intensities in wood products. If weakly consistent coefficients are included, the results indicate that MNEs had consistently higher total energy intensities in metal products in the two shorter periods. In most cases, both the size of estimated differentials and their significance varied substantially among industries, periods, and estimation techniques. On the other hand, coefficients on other inputs were consistently significant in most of the estimates, with labor and capital again complementing resource usage in the production process, while other intermediate expenditures substituted for resource usage (Appendix Table 5). On the other hand, energy and water intensities were more weakly and inconsistently correlated with the technology proxies and MNE ownership.

When MNE-local differentials in total energy intensities were at least weakly significant, they were generally negative. In the pooled estimates, there were consistently negative differentials in three industries, rubber, plastics, and non-metallic minerals, but none of these differentials were consistent when the more meaningful random effects estimator was used. Pooled estimates also indicated a significant positive differential in food and beverages in the early period and in chemicals for the latter period, but this differential was not consistent over time in the pooled estimates and never significant when the random effects estimates were performed. Almost all random effects estimates (the aforementioned metal products case is the sole exception) indicate MNE-local differentials were insignificant for total energy intensities.

Although fuel was a minority of total energy consumption in most industries, results for estimates of MNE-local differentials in fuel intensities were qualitatively similar to results for total energy intensities in most industries. Differentials in fuel intensities were also significant more often. In addition to the lower fuel intensities in wood, pooled estimates suggested MNEs had lower and at least weakly significant fuel intensities in six more industries: paper, rubber, plastics, non-metallic mineral products, basic metals, and electronics-related machinery. Conversely pooled results suggested consistent, significantly higher fuel intensities among MNEs in food and beverages and metal products. However, most of the MNE-local differentials in these eight industries became insignificant when the random effects estimator was used. In other words, the pooled estimator suggests a pattern similar to that observed in the descriptive statistics with MNEs tending to have lower fuel intensities in most industries, but the more meaningful, random effects results indicate these relationships were not significant statistically.

The correlations of MNE ownership to electricity or water intensities were generally weaker than correlations to fuel intensities and more inconsistent across time, but somewhat more consistent across estimation techniques (Table 5). For example, both pooled and random effects estimates suggested MNEs had higher electricity propensities that were at least weakly significant for the earlier period but not the latter in wood and in the latter period but not the earlier one in paper, metal products, and electronics-related machinery. There were also four other positive and at least weakly significant differentials in wood (latter period, random effects), chemicals and basic metals (latter period, pooled), and metal products (earlier period, pooled) but no significantly negative ones.

Both estimators also suggested MNEs had significantly lower water intensities in 2000-2002 but not 2002-2004 in four industries: paper, chemicals, non-metallic mineral products, and electronics-related machinery. Random effects estimates also revealed a weakly significant negative differential in food and beverage in the early period. However, in the latter period, MNE-local differentials in water intensities were all insignificant if the random effects estimator was used and nine of the 11 differentials were also insignificant when the pooled estimator was employed. The weakly significant, negative differential in paper and the positive differential in metal products were the exceptions.

In other words, MNEs generally had lower fuel intensities than local plants and these MNE-local differentials were statistically meaningful in a number of cases. MNEs also had higher electricity intensities and lower total energy and water intensities in several cases, but these relationships were seldom significant statistically, even when a relatively low threshold (10 percent) was used. There is thus some evidence that MNEs have a tendency to use fuel more efficiently than local plants but this is offset somewhat by a weaker tendency to use relatively more electricity. As a result, MNEs used total energy more in a few industries and periods, but total fuel intensity differentials were generally insignificant. When significant, MNE-local differentials in water intensities were also negative, but these differentials were also insignificant in most cases examined, and almost all in the latter period. Finally, significant coefficients in the equations combining all 11 industries suggest qualitatively, similar patterns. However, it is clear that the size of MNE-local differentials (and other slope coefficients) differed greatly among these 11 industries. And the industry-level results indicate that differences in energy and water intensities between MNEs and local plants were not pervasive during this period in Malaysia's medium-large plants.

5. Conclusions

This paper has examined whether foreign MNEs used energy and water more efficiently than their local counterparts in a sample of medium-large plants in Malaysian manufacturing during 2000-2004. A literature review highlighted the fact that foreign MNEs are generally assumed to have superior technology to local plants in developing economies like Malaysia. This creates the possibility that they might use inputs like energy and water relatively efficiently. However, the empirical evidence regarding productivity differentials is at best mixed in Malaysia and other Southeast Asian economies.

Both descriptive statistics and results of econometric estimation are consistent with this mixed picture. They suggest that the relationship between MNE ownership and energy or water intensities was relatively weak during this period in Malaysia. The strongest correlations were observed for fuel intensities, with MNEs having a moderate tendency to use relatively little of this relatively dirty source of energy. MNEs also had a weak tendency to have high electricity intensities as well as low total energy and water intensities. However, differences in energy and water intensities between MNEs and local plants were not pervasive. These results are consistent with the notion that Malaysia is a middle-income economy and many of its local manufacturers are able use energy and water with an efficiency level that is similar to the MNEs operating in the economy. The results also suggest that both MNEs and local plants react to Malaysian policies affecting resource prices and regulating resource-related pollution in a similar manner.

However, these results need to be interpreted with caution for at least two reasons. First, there is also a potentially important omitted variable problem because the data do not contain information on the quantity of energy or used. Unfortunately, nothing can be done about this issue. Second, the estimation techniques used in this paper do not adequately account for potential simultaneity. Because the data can be panelized it should be possible to account for this problem by lagging problematic independent variables or using them to facilitate instrumental variables estimation. This has purposefully been avoided in this paper because one goal has been to create estimates for Malaysia that can be compared with cross section estimates of similar models for Indonesia and Thailand, where a similar approach to the simultaneity problem is impossible.

It is also important to investigate these and related relationships further. For example, it would be interesting to modify these basic models to incorporate how the influences of research and development might interact with MNE ownership. In other words, the effect of foreign ownership might be different for MNEs engaged in any R&D than for MNEs not engaged in R&D. Finally, as explained in the introduction, it is also important to see if MNC presence affects energy intensities in local plants, that is whether MNCs are a source of energy efficiency spillovers to local plants. We leave these topics for future research.

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Table 1: Expenditures on Energy and Water in Medium-Large Plants with Viable Data and MNE shares

	Energy (electricity plus fuels) expenditures						Water					
	Expenditures (RM millions)			MNE shares (%)			Expenditures (RM millions)			MNE shares (%)		
Industry	2000	2001-02	2003-04	2000	2001-02	2003-04	2000	2001-02	2003-04	2000	2001-02	2003-04
Manufacturing	9,873	9,608	11,665	36	42	37	592	483	588	28	45	45
Large Resource Users	9,132	8,895	10,854	36	42	37	538	436	535	29	48	47
Food, beverages	950	922	1,121	21	23	21	68	55	68	17	29	28
Textiles	522	487	448	72	74	74	23	25	19	54	53	57
Wood products	439	415	512	16	17	18	16	16	20	16	15	17
Paper products	392	305	346	9	14	9	16	21	15	5	7	6
Petroleum products	315	410	777	32	74	14	29	13	16	16	71	39
Chemicals	1,057	1,190	1,643	54	58	48	70	83	131	39	55	57
Rubber products	575	567	654	31	33	33	36	37	40	39	43	36
Plastics	434	451	512	21	29	35	35	24	30	14	29	30
Non-metallic mineral products	1,308	1,367	1,443	23	23	28	20	28	27	18	21	32
Basic metals	830	954	1,260	14	13	11	21	17	30	15	29	18
Metal products	327	249	296	39	45	40	27	14	19	23	51	50
Electronics-related machinery	1,983	1,579	1,845	57	81	76	176	103	121	37	77	73
Small Resource Users	741	713	811	31	33	30	55	47	54	18	25	25
Tobacco	27	32	26	29	26	22	1	1	1	20	16	28
Apparel	61	58	59	29	39	43	7	6	7	19	36	33
Leather, footwear	12	9	11	36	31	36	1	1	1	21	39	28
Publishing	67	67	74	10	11	11	7	5	5	5	9	15
General machinery	173	175	187	67	67	57	11	10	10	43	49	50
Motor vehicles	153	163	202	12	10	14	9	9	10	5	5	12
Other transport equipment	63	59	73	19	19	20	4	4	4	8	13	14
Miscellaneous & recycling	185	151	178	27	33	29	16	11	15	15	25	21

Note: This table includes plants with 20 or more paid workers and positive output, employee compensation, and fixed assets.

Source: Author's compilations from micro data underlying Department of Statistics (2002, various years)

Table 2: Energy and Water Intensities in Medium-Large MNEs and Percentage Point Differentials between MNEs and Majority-local Plants

	Energy (electricity plus fuels)/Output, %						Water/Output, %					
	MNEs			MNE-local differentials			MNEs			MNE-local differentials		
Industry	2000	2001-02	2003-04	2000	2001-02	2003-04	2000	2001-02	2003-04	2000	2001-02	2003-04
Manufacturing (20 industry mean)	2.94	3.19	3.19	-1.065	-0.375	-0.327	0.16	0.21	0.20	-0.160	-0.010	-0.005
Large Resource Users (12 industry mean)	3.61	3.88	3.99	-1.108	-0.326	-0.176	0.20	0.25	0.24	-0.177	0.004	0.005
Food, beverages	2.67	2.96	5.40	-1.070	-0.754	1.569	0.24	0.27	0.40	-0.254	-0.097	0.056
Textiles	5.12	5.36	5.42	0.118	0.851	0.895	0.54	0.61	0.38	0.083	0.123	-0.011
Wood products	3.61	3.78	3.90	-0.115	-0.234	-0.129	0.15	0.20	0.15	-0.020	0.020	-0.022
Paper products	2.52	2.61	2.88	-1.260	-1.119	-0.533	0.10	0.12	0.12	-0.191	-0.071	-0.050
Petroleum products	0.84	1.08	0.69	-4.636	-1.619	-3.318	0.11	0.11	0.11	-0.471	0.036	0.031
Chemicals	3.46	3.90	3.34	-0.354	0.471	0.263	0.15	0.19	0.21	-0.310	-0.060	-0.024
Rubber products	5.25	5.15	4.64	-0.779	-0.816	-1.148	0.36	0.41	0.35	-0.008	0.062	0.001
Plastics	3.67	4.17	3.91	-1.063	-0.390	-0.379	0.20	0.24	0.27	-0.223	-0.052	-0.034
Non-metallic mineral products	8.02	7.78	8.63	-2.879	-2.289	-1.178	0.14	0.20	0.26	-0.187	-0.050	0.010
Basic metals	3.13	4.04	3.62	-0.741	0.638	0.615	0.11	0.21	0.17	-0.163	0.038	-0.004
Metal products	3.07	3.39	3.20	0.346	1.266	1.134	0.16	0.30	0.29	-0.164	0.143	0.134
Electronics-related machinery	2.01	2.36	2.20	-0.863	0.088	0.091	0.15	0.16	0.15	-0.213	-0.046	-0.023
Small Resource Users (8 industry mean)	1.94	2.15	2.01	-1.001	-0.450	-0.553	0.09	0.14	0.14	-0.135	-0.031	-0.019

Note: This table includes plants with 20 or more paid workers and positive output, employee compensation, and fixed assets.

Source: Author's compilations from micro data underlying Department of Statistics (2002, various years)

Table 3: Electricity and Fuel Intensities in Medium-Large MNEs and Percentage Point Differentials between MNEs and Majority-local Plants

	Electricity/Output, %						Fuels/Output, %					
	MNEs			MNE-local differentials			MNEs			MNE-local differentials		
Industry	2000	2001-02	2003-04	2000	2001-02	2003-04	2000	2001-02	2003-04	2000	2001-02	2003-04
Manufacturing (20 indutry-level mean)	2.01	2.23	2.17	-0.338	0.311	0.373	0.93	0.96	1.02	-0.727	-0.686	-0.700
Large Resource Users (12 industry mean)	2.40	2.66	2.65	-0.402	0.387	0.518	1.21	1.22	1.34	-0.706	-0.712	-0.695
Food, beverages	1.60	1.76	3.89	-0.559	-0.278	1.831	1.07	1.20	1.51	-0.511	-0.476	-0.262
Textiles	3.55	3.94	3.97	0.524	1.139	1.401	1.58	1.42	1.45	-0.405	-0.289	-0.506
Wood products	2.57	2.71	2.59	0.647	0.699	0.472	1.04	1.07	1.31	-0.762	-0.933	-0.602
Paper products	1.83	1.97	2.10	-0.607	-0.183	0.102	0.69	0.64	0.78	-0.653	-0.936	-0.634
Petroleum products	0.44	0.53	0.28	-3.178	-0.242	-0.601	0.40	0.56	0.41	-1.458	-1.377	-2.717
Chemicals	2.39	2.72	2.24	-0.386	0.467	0.278	1.07	1.18	1.10	0.032	0.004	-0.015
Rubber products	3.14	3.10	2.69	0.052	0.121	0.059	2.11	2.05	1.95	-0.831	-0.937	-1.207
Plastics	3.36	3.75	3.48	-0.784	-0.244	-0.221	0.30	0.43	0.43	-0.279	-0.146	-0.158
Non-metallic mineral products	3.61	3.78	3.76	0.386	0.880	1.012	4.41	4.00	4.87	-3.265	-3.169	-2.190
Basic metals	2.39	3.01	2.55	-0.226	0.838	0.661	0.74	1.02	1.06	-0.515	-0.200	-0.046
Metal products	2.12	2.48	2.28	0.058	1.171	1.004	0.95	0.90	0.92	0.288	0.095	0.130
Electronics-related machinery	1.83	2.15	1.95	-0.745	0.273	0.219	0.18	0.21	0.25	-0.118	-0.186	-0.128
Small Resource Users (8 industry mean)	1.43	1.58	1.46	-0.243	0.196	0.155	0.51	0.57	0.55	-0.758	-0.646	-0.709

Note: This table includes plants with 20 or more paid workers and positive output, employee compensation, and fixed assets.

Source: Author's compilations from micro data underlying Department of Statistics (2002, various years)

Table 4: Slope Coefficients from Estimates of MNE-Local Energy and Water Intensity Differentials, 12 Large Resource Using Industries Combined

Independent variable, R^2, industry	2000-2002 Pooled	2000-2002 R. Effects	2002-2004 Pooled	2002-2004 R. Effects	2000-2004 Pooled	2000-2004 R. Effects
TOTAL ENERGY INTENSITIES						
LE_{it}	1.5117 a	1.2047 a	1.6296 a	1.5916 a	1.5325 a	1.3025 a
LK_{it}	0.5970 a	0.3618 a	0.4804 a	0.3801 a	0.5381 a	0.3739 a
LM_{it}	-1.8237 a	-1.5175 a	-1.7649 a	-1.7451 a	-1.7797 a	-1.6398 a
ES_{it}	0.0197 a	0.0146 a	0.0109 a	0.0149 a	0.0150 a	0.0161 a
RD_{it}	-0.0484	-0.0566	0.0079	0.0270	-0.0248	0.0075
DF_{it}	-0.0600	-0.0328	0.4269 c	0.4863 c	0.1727	0.1521
R^2	0.28	0.27	0.23	0.22	0.24	0.23
ELECTRICITY INTENSITIES						
LE_{it}	0.6529 a	0.6052 a	0.7833 a	0.8189 a	0.7006 a	0.6737 a
LK_{it}	0.3892 a	0.2297 a	0.3329 a	0.2873 a	0.3578 a	0.2865 a
LM_{it}	-0.9973 a	-0.8597 a	-1.0551 a	-1.0682 a	-1.0191 a	-0.9868 a
ES_{it}	0.0203 a	0.0130 a	0.0120 a	0.0133 a	0.0158 a	0.0164 a
RD_{it}	-0.0001	-0.0174	0.0095	0.0179 a	-0.0074	0.0082
DF_{it}	0.1391 b	0.0049	0.6080 b	0.6236 a	0.3635 b	0.2351 c
R^2	0.18	0.17	0.11	0.11	0.12	0.12
FUEL INTENSITIES						
LE_{it}	0.8358 a	0.6410 a	0.8283 a	0.6146 a	0.8109 a	0.5422 a
LK_{it}	0.2111 a	0.1294 a	0.1493 a	0.0768 a	0.1827 a	0.0854 a
LM_{it}	-0.8100 a	-0.6809 a	-0.6951 a	-0.6034 a	-0.7446 a	-0.6054 a
ES_{it}	-0.0012	0.0002	-0.0020	0.0028	-0.0017	0.0009
RD_{it}	-0.0502 b	-0.0431	-0.0009	0.0003	-0.0176	-0.0030
DF_{it}	-0.2089 a	-0.0588	-0.1894 a	-0.0501	-0.1994 a	0.0118
R^2	0.26	0.25	0.28	0.28	0.26	0.26
WATER INTENSITIES						
LE_{it}	0.0571 a	0.0477 a	0.0878 a	0.0793 a	0.0670 a	0.0487 a
LK_{it}	0.0246 a	0.0249 a	0.0206 a	0.0184 a	0.0230 a	0.0214 a
LM_{it}	-0.0991 a	-0.0923 a	-0.1127 a	-0.1112 a	-0.1031 a	-0.0926 a
ES_{it}	0.0032 a	0.0032 a	0.0024 a	0.0021 a	0.0027 a	0.0025 a
RD_{it}	-0.0015	-0.0156	0.0019	-0.0006	-0.0004	-0.0070
DF_{it}	-0.0628 a	-0.0845 a	0.0179	0.0250	-0.0297 a	-0.0544 a
R^2	0.06	0.05	0.07	0.07	0.06	0.06

Notes: a=signficant at the 1% level, b=significant at the 5% level, c=significant at the 10% level (all p-values based on robust standard errors [clustered by plant for random effects]); estimated equations also include industry and state dummies as relevant (see explanation in the text); Breusch-Pagan Lagrangian multiplier tests rejected the null of no random effects at less than the 1% level in all samples examined; for samples sizes and precise p-values, see Appendix Table 4.

Table 5: Estimates of MNE-Local Energy and Water Intensity Differentials by Industry
(coefficients on DF_{it} from 11 Industry-level samples and a combined sample)

	2000-2002		2002-2004		2000-2004	
Industry	Pooled	R. Effects	Pooled	R. Effects	Pooled	R. Effects
TOTAL ENERGY INTENSITIES						
11 industries combined	-0.0587	-0.0175	0.4310 c	0.4885 c	0.1760	0.1588
Food, beverages	0.4585 b	0.1948	2.7791	2.9539	1.7783	1.6933
Textiles	-0.0734	0.7605	0.1662	0.0575	-0.0771	0.5267
Wood products	-0.1510	-0.1119	-0.2416	0.0200	-0.1772	0.1117
Paper products	-0.1482	-0.4053	0.2840	0.0914	0.0497	-0.0999
Chemicals	0.2187	0.1218	0.5290 c	0.3657	0.3558	0.1870
Rubber products	-0.8498 b	0.0548	-1.4139 a	-0.5438	-1.0906 a	0.0774
Plastics	-0.8486 b	0.0579	-1.4156 a	-0.5463	0.0240	-0.1207
Non-metallic mineral products	-1.6691 b	-0.6604	-1.1930 c	0.3821	-1.2032 b	0.5199
Basic metals	-0.1404	0.1707	0.2592	0.4492	0.0083	0.1950
Metal products	0.8984 a	0.4498 c	1.2226 a	0.7088 a	0.9980 a	0.3119
Electronics-related machinery	-0.0113	0.0407	0.3322 b	0.2782	0.0742	-0.0599
ELECTRICITY INTENSITIES						
11 industries combined	0.1432 b	0.0232	0.6106 b	0.6253 b	0.3669 a	0.2420 c
Food, beverages	0.2315	0.1502	2.3882	2.5627	1.4678	1.4222
Textiles	0.1816	0.3577	0.4981	0.4548	0.2635	0.3688
Wood products	0.4311 b	0.4078 b	0.3009	0.5214 b	0.3828 a	0.4361 b
Paper products	0.1148	-0.1636	0.5593 a	0.3529 c	0.3271 b	-0.0141
Chemicals	0.1686	0.1082	0.5547 b	0.3839	0.3227	0.1910
Rubber products	0.2281	0.3134	0.1103	0.1338	0.1702	0.2314
Plastics	0.2268	0.3125	0.1053	0.1297	0.1487	-0.0126
Non-metallic mineral products	-0.0306	-0.1893	-0.0402	0.3470	0.0146	0.0956
Basic metals	0.2241	0.1300	0.4728 c	0.4095	0.3182	0.1680
Metal products	0.5488 a	0.0312	0.8424 a	0.5239 a	0.6437 a	0.0947
Electronics-related machinery	0.0511	-0.0423	0.3945 a	0.3427 b	0.1298	-0.0784
FUEL INTENSITIES						
11 industries combined	-0.2114 a	-0.0610	-0.1878 a	-0.0494	-0.1993 a	0.0097
Food, beverages	0.2191 b	0.1303	0.3810 b	0.3300 c	0.3030 a	0.1326
Textiles	-0.2891	0.3806	-0.3697	-0.4346	-0.3782 c	0.1648
Wood products	-0.5889 a	-0.5337 a	-0.5554 a	-0.4869 b	-0.5686 a	-0.3215 b
Paper products	-0.3044 c	-0.2382	-0.3103 b	-0.2612	-0.3146 a	-0.0976
Chemicals	0.0624	0.0188	-0.0251	-0.0669	0.0397	-0.0045
Rubber products	-1.0879 a	-0.2794	-1.5334 a	-0.5811 c	-1.2693 a	-0.1338
Plastics	-1.0853 a	-0.2753	-1.5298 a	-0.5817 c	-0.1247 b	-0.1036
Non-metallic mineral products	-1.7141 a	-0.6300	-1.2451 b	0.0764	-1.2859 a	0.3596
Basic metals	-0.3696 a	0.0855	-0.2164 c	0.0100	-0.3140 a	-0.0246
Metal products	0.3542 a	0.3357 a	0.3877 a	0.1651	0.3600 a	0.2033 b
Electronics-related machinery	-0.0643 b	0.0231	-0.0635 c	-0.0458	-0.0570 b	0.0197

Table 5 (continued)

Independent variable, R^2, industry	2000-2002		2002-2004		2000-2004	
	Pooled	R. Effects	Pooled	R. Effects	Pooled	R. Effects
WATER INTENSITIES						
11 industries combined	-0.0624 a	-0.0826 a	0.0175	0.0245	-0.0296 a	-0.0531 a
Food, beverages	-0.0481	-0.0545 c	0.1351	0.1601	0.0453	0.0313
Textiles	0.1800	0.0891	0.0830	0.1388	0.1045	0.0890
Wood products	0.0006	-0.0012	-0.0054	0.0013	-0.0063	-0.0079
Paper products	-0.0874 a	-0.1027 a	-0.0425 c	-0.0122	-0.0604 a	-0.0468 c
Chemicals	-0.1456 b	-0.1678 b	-0.0169	-0.0145	-0.0981 b	-0.1043 b
Rubber products	-0.0028	0.0125	-0.0267	-0.0249	-0.0186	-0.0105
Plastics	-0.0033	0.0120	-0.0274	-0.0256	-0.0469 b	-0.0669 b
Non-metallic mineral products	-0.0964 a	-0.0978 b	-0.0137	-0.0072	-0.0609 b	-0.0659
Basic metals	-0.0345	-0.0431	0.0085	0.0146	-0.0282	-0.0709 b
Metal products	-0.0033	-0.0452	0.0993 a	0.0535	0.0335	-0.0555 c
Electronics-related machinery	-0.1198 a	-0.1219 a	-0.0242	-0.0125	-0.0863 a	-0.0927 a

Notes: a=signficant at the 1% level, b=significant at the 5% level, c=significant at the 10% level (all p-values based on robust standard errors [clustered by plant for random effects]); estimated equations also include industry and state dummies as relevant (see explanation in the text); Breusch-Pagan Lagrangian multiplier tests rejected the null of no random effects at less than the 1% level in all samples examined except water intensities for chemicals in 2000-2002 when the null was rejected at the 2% level; for samples sizes and precise p-values, see Appendix Tables 4-5.

Appendix Table 1a: Expenditures on Electricity and Fuels in Medium-Large Plants with Viable Data (RM millions)

	Majority-local plants					MNE plants				
Industry	2000	2001	2002	2003	2004	2000	2001	2002	2003	2004
Manufacturing	6,341	5,205	5,991	7,137	7,605	3,532	3,699	4,320	3,967	4,621
Large Energy Users	5,832	4,763	5,461	6,615	6,996	3,300	3,481	4,085	3,747	4,349
Food, beverages	754	684	725	858	920	196	205	230	216	247
Textiles	148	124	134	119	113	374	362	353	311	353
Wood products	368	340	349	410	432	71	71	71	75	106
Paper products	356	254	285	300	328	36	43	29	30	35
Petroleum products	215	83	151	641	691	100	237	349	104	117
Chemicals	484	437	599	827	887	573	596	748	680	892
Rubber products	394	375	380	432	444	181	183	195	212	220
Plastics	344	268	349	330	337	90	111	174	204	152
Non-metallic mineral products	1,010	1,030	1,040	989	1,080	298	311	352	380	436
Basic metals	717	769	877	1,120	1,110	113	117	145	165	124
Metal products	199	126	157	159	195	128	105	109	130	107
Electronics-related machinery	843	273	415	430	459	1,140	1,140	1,330	1,240	1,560
Small Energy Users	509	442	530	522	609	231	219	236	220	272
Tobacco	19	21	27	20	21	8	8	7	5	6
Apparel	44	31	32	35	33	18	19	34	27	25
Leather, footwear	8	6	7	6	8	4	3	2	2	6
Publishing	60	53	68	61	71	7	7	7	8	8
General machinery	58	54	76	78	82	115	111	110	90	125
Motor vehicles	135	136	163	144	201	18	14	13	29	29
Other transport equipment	51	47	49	58	60	12	11	12	12	18
Miscellaneous & recycling	135	95	109	121	133	50	47	51	46	56

Note: This table includes plants with 20 or more paid workers and positive output, employee compensation, and fixed assets.

Source: Author's compilations from micro data underlying Department of Statistics (2002, various years)

Appendix Table 1b: Expenditures on Electricity in Medium-Large Plants with Viable Data (RM millions)

	Majority-local plants					MNE plants				
Industry	2000	2001	2002	2003	2004	2000	2001	2002	2003	2004
Manufacturing	4,032	2,885	3,380	3,684	3,852	2,507	2,570	2,866	2,691	2,997
Large Energy Users	3,628	2,552	2,980	3,286	3,400	2,334	2,404	2,682	2,526	2,791
Food, beverages	394	313	343	388	393	96	106	114	98	119
Textiles	101	82	87	72	68	293	291	275	233	276
Wood products	213	200	200	251	252	55	58	53	55	73
Paper products	182	117	162	131	140	27	33	21	21	25
Petroleum products	157	41	39	204	126	30	109	140	32	36
Chemicals	296	257	285	336	437	373	312	434	381	450
Rubber products	171	142	152	158	167	92	96	100	110	116
Plastics	304	237	302	291	297	85	99	156	169	140
Non-metallic mineral products	432	416	446	406	426	133	148	168	184	202
Basic metals	428	423	491	561	563	84	84	107	116	94
Metal products	154	84	108	106	132	78	67	73	88	78
Electronics-related machinery	796	238	363	381	397	988	1,001	1,041	1,037	1,183
Small Energy Users	405	333	401	398	452	173	166	184	166	207
Tobacco	11	12	14	10	10	5	5	5	4	5
Apparel	37	26	27	28	26	16	17	28	21	21
Leather, footwear	7	4	5	5	7	4	2	2	2	5
Publishing	54	46	60	55	62	6	6	7	7	7
General machinery	43	39	53	55	58	82	82	84	69	92
Motor vehicles	105	100	119	109	143	12	10	10	21	21
Other transport equipment	36	28	36	39	39	9	9	10	10	14
Miscellaneous & recycling	111	78	87	97	107	39	37	39	32	41

Note: This table includes plants with 20 or more paid workers and positive output, employee compensation, and fixed assets.

Source: Author's compilations from micro data underlying Department of Statistics (2002, various years)

Appendix Table 1c: Expenditures on Water in Medium-Large Plants with Viable Data (RM millions)

	Majority-local plants					MNE plants				
Industry	2000	2001	2002	2003	2004	2000	2001	2002	2003	2004
Manufacturing	425	246	281	310	339	167	201	239	246	281
Large Energy Users	380	214	243	273	296	157	189	226	234	266
Food, beverages	57	37	41	46	52	12	16	16	20	17
Textiles	10	11	13	8	8	12	13	14	11	11
Wood products	13	13	14	17	16	3	2	2	2	5
Paper products	16	15	25	13	15	1	3	1	1	1
Petroleum products	25	4	4	10	9	5	8	10	6	6
Chemicals	43	33	42	55	57	27	35	56	67	83
Rubber products	22	20	22	24	28	14	15	17	14	15
Plastics	30	15	19	20	22	5	6	8	10	8
Non-metallic mineral products	16	29	15	15	22	4	5	7	8	9
Basic metals	18	11	14	23	26	3	4	5	6	5
Metal products	20	6	8	9	10	6	7	8	10	9
Electronics-related machinery	110	20	27	33	32	66	75	83	79	98
Small Energy Users	45	32	38	37	43	10	11	13	12	15
Tobacco	1	1	1	1	1	0	0	0	0	0
Apparel	5	4	4	5	5	1	2	3	2	2
Leather, footwear	1	1	1	1	1	0	0	0	0	0
Publishing	6	5	4	4	5	0	0	0	1	1
General machinery	6	4	6	5	5	5	4	5	4	6
Motor vehicles	8	8	9	8	10	0	0	0	1	1
Other transport equipment	4	3	4	4	3	0	1	0	0	1
Miscellaneous & recycling	13	8	9	11	12	2	3	3	3	4

Note: This table includes plants with 20 or more paid workers and positive output, employee compensation, and fixed assets.

Source: Author's compilations from micro data underlying Department of Statistics (2002, various years)

Appendix Table 1d: Gross Output in Medium-Large Plants with Viable Data (RM millions)

	Majority-local plants					MNE plants				
Industry	2000	2001	2002	2003	2004	2000	2001	2002	2003	2004
Manufacturing	207,859	185,217	222,032	257,045	304,572	222,810	205,290	230,050	252,284	291,543
Large Energy Users	172,367	146,381	173,093	214,271	250,957	208,105	191,138	216,099	236,848	270,894
Food, beverages	36,428	35,045	47,210	58,006	59,866	10,434	9,885	11,327	12,391	14,350
Textiles	2,725	2,443	2,684	2,443	2,432	4,953	4,149	3,822	3,570	3,961
Wood products	11,047	9,473	9,759	10,836	12,108	2,000	1,797	1,897	2,018	2,678
Paper products	5,498	4,442	5,456	5,182	6,124	1,055	1,404	1,264	1,053	1,441
Petroleum products	20,309	17,296	19,823	31,392	41,553	9,747	13,721	20,214	10,001	13,700
Chemicals	12,278	10,356	13,494	17,849	22,799	14,396	13,070	16,898	21,522	33,082
Rubber products	7,169	6,729	7,096	8,206	9,721	3,759	3,591	3,847	4,953	5,679
Plastics	8,303	7,261	9,128	9,799	10,092	3,071	2,976	6,837	7,368	6,422
Non-metallic mineral products	8,462	8,567	9,006	8,879	10,494	3,469	3,285	3,597	3,925	4,271
Basic metals	11,355	10,612	12,825	15,380	24,144	4,151	3,399	4,026	5,722	4,533
Metal products	7,286	6,237	7,945	8,670	10,552	4,150	3,215	3,537	4,631	5,107
Electronics-related machinery	41,508	27,920	28,668	37,629	41,072	146,920	130,647	138,833	159,694	175,670
Small Energy Users	35,492	38,837	48,939	42,775	53,614	14,705	14,151	13,951	15,436	20,649
Tobacco	1,245	1,306	1,588	1,279	1,349	460	446	563	527	606
Apparel	3,420	2,727	2,928	3,184	3,027	1,602	1,663	2,041	1,753	2,713
Leather, footwear	294	256	276	300	494	209	247	199	192	275
Publishing	4,001	3,978	4,616	4,624	5,307	504	448	470	578	601
General machinery	3,489	4,568	6,221	5,276	6,256	7,604	7,238	6,430	5,870	8,103
Motor vehicles	12,942	16,061	21,417	15,664	23,383	1,094	881	979	3,374	3,787
Other transport equipment	3,374	3,789	4,332	4,587	4,872	762	639	750	891	1,674
Miscellaneous & recycling	6,726	6,153	7,561	7,861	8,927	2,470	2,590	2,520	2,251	2,890

Note: This table includes plants with 20 or more paid workers and positive output, employee compensation, and fixed assets.

Source: Author's compilations from micro data underlying Department of Statistics (2002, various years)

Appendix Table 1e: Number of Medium-Large Plants with Viable Data

Industry	Majority-local plants					MNE plants				
	2000	2001	2002	2003	2004	2000	2001	2002	2003	2004
Manufacturing	7,010	6,032	6,172	6,165	6,249	1,530	1,374	1,398	1,379	1,332
Large Energy Users	5,075	4,350	4,481	4,436	4,458	1,224	1,096	1,129	1,122	1,057
Food, beverages	1,126	1,105	1,137	1,086	1,094	93	91	96	90	89
Textiles	173	147	148	151	145	42	40	37	34	33
Wood products	724	602	597	583	547	54	46	46	43	44
Paper products	231	181	185	196	213	37	36	40	37	39
Petroleum products	31	19	15	23	21	6	7	5	4	4
Chemicals	280	234	228	259	276	128	123	137	133	134
Rubber products	287	205	211	207	215	98	89	81	76	76
Plastics	599	460	488	489	484	116	109	111	119	115
Non-metallic mineral products	413	381	370	359	362	50	52	53	51	53
Basic metals	232	212	215	211	240	56	51	52	51	48
Metal products	526	505	555	544	577	115	102	97	111	100
Electronics-related machinery	453	299	332	328	284	429	350	374	373	322
Small Energy Users	1,935	1,682	1,691	1,729	1,791	306	278	269	257	275
Tobacco	167	133	125	124	136	3	2	2	3	3
Apparel	313	266	214	220	255	48	41	38	40	36
Leather, footwear	63	58	63	54	66	9	9	8	7	7
Publishing	305	303	293	290	289	22	20	20	21	21
General machinery	282	260	275	315	297	87	82	79	64	77
Motor vehicles	133	117	135	134	127	19	17	18	21	21
Other transport equipment	102	86	98	94	95	8	10	10	12	18
Miscellaneous & recycling	570	459	488	498	526	110	97	94	89	92

Note: This table includes plants with 20 or more paid workers and positive output, employee compensation, and fixed assets.
Source: Author's compilations from micro data underlying Department of Statistics (2002, various years)

Appendix Table 1f: Expenditures on Electricity and Fuels in All Plants with Viable Data (RM millions)

	Majority-local plants					MNE plants				
Industry	2000	2001	2002	2003	2004	2000	2001	2002	2003	2004
Manufacturing	6,513	5,286	6,079	7,369	7,932	3,543	3,708	4,326	3,976	4,628
Large Energy Users	5,969	4,825	5,533	6,832	7,308	3,311	3,489	4,090	3,757	4,355
Food, beverages	802	709	752	887	950	196	206	230	216	248
Textiles	152	127	135	121	116	374	362	353	311	353
Wood products	376	343	351	413	436	71	71	71	75	106
Paper products	361	255	286	302	330	36	43	29	30	35
Petroleum products	219	85	158	797	922	100	237	349	104	117
Chemicals	496	440	607	831	904	581	603	753	687	896
Rubber products	397	376	382	433	445	181	183	195	213	220
Plastics	361	273	355	335	343	91	111	174	204	152
Non-metallic mineral products	1,020	1,040	1,050	996	1,090	299	311	352	380	436
Basic metals	724	770	878	1,120	1,110	113	117	145	166	124
Metal products	214	133	163	166	202	128	105	109	130	108
Electronics-related machinery	847	274	416	431	460	1,140	1,140	1,330	1,240	1,560
Small Energy Users	544	461	546	537	624	232	219	236	220	273
Tobacco	20	21	27	20	21	8	8	7	5	6
Apparel	47	34	35	37	35	18	19	34	27	25
Leather, footwear	9	7	7	6	9	4	3	2	2	6
Publishing	68	55	70	63	74	7	7	7	8	8
General machinery	67	61	81	83	84	115	111	110	90	125
Motor vehicles	137	137	163	145	202	18	14	13	29	29
Other transport equipment	52	48	49	58	61	12	11	12	12	18
Miscellaneous & recycling	145	100	113	125	138	50	47	51	46	57

Note: This table includes plants with 1 or more paid workers and positive output, employee compensation, and fixed assets.
Source: Author's compilations from micro data underlying Department of Statistics (2002, various years)

Appendix Table 1g: Expenditures on Electricity in All Plants with Viable Data (RM millions)

Industry	Majority-local plants					MNE plants				
	2000	2001	2002	2003	2004	2000	2001	2002	2003	2004
Manufacturing	4,154	2,933	3,429	3,731	3,910	2,519	2,579	2,873	2,698	3,003
Large Energy Users	3,721	2,586	3,017	3,321	3,448	2,345	2,412	2,688	2,532	2,796
Food, beverages	424	326	357	404	409	97	106	114	98	120
Textiles	104	84	89	74	70	293	291	275	233	276
Wood products	218	202	202	253	254	55	58	53	55	73
Paper products	186	117	163	132	141	27	33	21	21	25
Petroleum products	159	42	40	205	127	30	109	140	32	36
Chemicals	306	259	289	338	450	381	318	439	385	454
Rubber products	173	143	152	159	167	93	96	100	110	116
Plastics	320	242	307	296	303	86	100	157	170	140
Non-metallic mineral products	434	418	448	408	429	133	148	168	184	202
Basic metals	433	424	492	562	564	84	84	107	116	94
Metal products	165	88	112	109	135	78	68	73	88	79
Electronics-related machinery	800	239	364	382	398	989	1,001	1,041	1,038	1,183
Small Energy Users	433	347	413	409	462	174	167	184	166	207
Tobacco	11	12	14	10	10	5	5	5	4	5
Apparel	40	29	29	31	28	16	17	28	21	21
Leather, footwear	8	5	6	5	7	4	2	2	2	5
Publishing	60	48	61	57	64	6	6	7	7	7
General machinery	50	44	57	59	59	82	82	84	69	92
Motor vehicles	107	100	120	109	143	12	10	10	21	21
Other transport equipment	37	28	37	40	40	9	9	10	10	14
Miscellaneous & recycling	120	81	89	99	110	39	37	39	32	41

Note: This table includes plants with 1 or more paid workers and positive output, employee compensation, and fixed assets.

Source: Author's compilations from micro data underlying Department of Statistics (2002, various years)

Appendix Table 1h: Expenditures on Water in All Plants with Viable Data (RM millions)

Industry	Majority-local plants					MNE plants				
	2000	2001	2002	2003	2004	2000	2001	2002	2003	2004
Manufacturing	444	254	288	317	347	168	201	240	247	282
Large Energy Users	394	219	248	278	302	158	190	227	235	266
Food, beverages	61	39	42	47	54	12	16	16	20	17
Textiles	11	11	13	9	8	12	13	14	11	11
Wood products	14	13	14	17	16	3	2	2	2	5
Paper products	16	15	25	13	15	1	3	1	1	1
Petroleum products	25	4	4	10	10	5	8	10	6	6
Chemicals	44	33	43	56	57	27	35	56	67	83
Rubber products	22	20	22	24	28	14	15	17	14	15
Plastics	32	16	19	21	23	5	6	8	10	8
Non-metallic mineral products	17	30	15	15	22	4	5	7	8	9
Basic metals	19	11	14	24	26	3	4	5	6	5
Metal products	22	7	9	9	10	6	7	8	10	9
Electronics-related machinery	111	21	28	34	32	66	75	83	79	98
Small Energy Users	50	34	40	39	45	10	11	13	12	15
Tobacco	1	1	1	1	1	0	0	0	0	0
Apparel	6	4	4	5	5	1	2	3	2	2
Leather, footwear	1	1	1	1	1	0	0	0	0	0
Publishing	7	5	5	4	5	0	0	0	1	1
General machinery	8	5	7	5	6	5	4	5	4	6
Motor vehicles	8	8	9	8	10	0	0	0	1	1
Other transport equipment	4	3	4	4	4	0	1	0	0	1
Miscellaneous & recycling	15	8	10	11	13	2	3	3	3	4

Note: This table includes plants with 1 or more paid workers and positive output, employee compensation, and fixed assets.
Source: Author's compilations from micro data underlying Department of Statistics (2002, various years)

Appendix Table 1i: Gross Output in All Plants with Viable Data (RM millions)

Industry	Majority-local plants 2000	2001	2002	2003	2004	MNE plants 2000	2001	2002	2003	2004
Manufacturing	219,751	193,587	230,326	266,507	314,854	223,257	205,533	230,261	252,591	291,753
Large Energy Users	182,567	153,674	180,459	222,836	260,401	208,495	191,353	216,287	237,122	271,072
Food, beverages	37,643	35,702	47,905	58,704	60,672	10,443	9,903	11,343	12,428	14,367
Textiles	2,899	2,551	2,768	2,528	2,533	4,962	4,149	3,824	3,570	3,962
Wood products	11,314	9,626	9,869	10,970	12,282	2,002	1,798	1,902	2,019	2,684
Paper products	5,636	4,500	5,518	5,253	6,196	1,077	1,408	1,264	1,058	1,449
Petroleum products	26,357	22,315	24,899	37,765	48,537	9,747	13,721	20,214	10,001	13,700
Chemicals	12,698	10,510	13,847	18,071	23,132	14,530	13,175	16,954	21,655	33,149
Rubber products	7,278	6,806	7,153	8,251	9,762	3,766	3,592	3,856	4,963	5,680
Plastics	8,688	7,385	9,264	9,954	10,275	3,111	2,993	6,873	7,387	6,442
Non-metallic mineral products	8,688	8,764	9,144	9,049	10,680	3,480	3,292	3,599	3,927	4,281
Basic metals	11,615	10,686	12,914	15,486	24,209	4,162	3,406	4,054	5,771	4,560
Metal products	8,065	6,828	8,431	9,111	10,962	4,167	3,228	3,545	4,636	5,114
Electronics-related machinery	41,686	28,000	28,748	37,693	41,160	147,048	130,690	138,860	159,708	175,682
Small Energy Users	37,184	39,913	49,867	43,671	54,452	14,762	14,180	13,975	15,469	20,681
Tobacco	1,257	1,309	1,591	1,285	1,354	460	446	563	527	606
Apparel	3,622	2,918	3,110	3,359	3,145	1,602	1,665	2,042	1,753	2,713
Leather, footwear	350	307	311	335	539	212	247	199	193	275
Publishing	4,304	4,094	4,724	4,768	5,453	506	448	470	579	603
General machinery	3,970	4,880	6,478	5,492	6,437	7,639	7,252	6,444	5,890	8,124
Motor vehicles	13,080	16,101	21,454	15,698	23,434	1,096	881	979	3,374	3,787
Other transport equipment	3,425	3,829	4,367	4,620	4,912	765	639	753	898	1,676
Miscellaneous & recycling	7,175	6,475	7,830	8,114	9,180	2,483	2,602	2,526	2,256	2,898

Note: This table includes plants with 20 or more paid workers and positive output, employee compensation, and fixed assets.
Source: Author's compilations from micro data underlying Department of Statistics (2002, various years)

Appendix Table 1j: Number of All Plants with Viable Data

Industry	Majority-local plants					MNE plants				
	2000	2001	2002	2003	2004	2000	2001	2002	2003	2004
Manufacturing	17,103	11,734	11,340	11,368	10,495	1,696	1,463	1,480	1,460	1,403
Large Energy Users	10,649	7,360	7,262	7,288	7,003	1,351	1,169	1,196	1,184	1,114
Food, beverages	2,824	1,969	1,966	1,908	1,947	104	96	100	96	99
Textiles	454	360	322	331	310	44	40	39	35	34
Wood products	1,215	946	890	871	779	56	48	48	44	45
Paper products	336	240	254	269	281	44	37	40	39	43
Petroleum products	51	26	23	32	30	6	7	5	4	4
Chemicals	483	343	346	374	396	160	144	153	150	145
Rubber products	377	251	258	256	258	103	92	86	83	78
Plastics	979	595	634	640	622	135	117	121	124	122
Non-metallic mineral products	811	647	617	610	592	62	59	56	54	59
Basic metals	492	318	315	335	327	62	56	58	57	52
Metal products	2,040	1,285	1,238	1,276	1,107	132	110	104	117	106
Electronics-related machinery	587	380	399	386	354	443	363	386	381	327
Small Energy Users	6,454	4,374	4,078	4,080	3,492	345	294	284	276	289
Tobacco	239	147	140	139	152	3	2	2	3	3
Apparel	1,747	1,307	1,191	1,187	712	49	43	39	40	36
Leather, footwear	254	179	160	152	137	12	9	9	8	8
Publishing	864	510	492	522	532	25	20	20	22	22
General machinery	1,034	642	602	623	573	105	90	88	76	84
Motor vehicles	264	188	190	193	182	20	17	18	21	21
Other transport equipment	194	156	166	159	149	10	10	12	15	19
Miscellaneous & recycling	1,858	1,245	1,137	1,105	1,055	121	103	96	91	96

Note: This table includes plants with 1 or more paid workers and positive output, employee compensation, and fixed assets.
Source: Author's compilations from micro data underlying Department of Statistics (2002, various years)

Appendix Table 2a: Energy (electricity and fuels) Intensities in Medium-Large Plants with Viable Data (percent)

	Majority-local plants					MNE plants				
Industry	2000	2001	2002	2003	2004	2000	2001	2002	2003	2004
Manufacturing (20 industry mean)	4.0	3.6	3.5	3.6	3.5	2.9	3.2	3.2	3.4	3.0
Large Energy Users (12 industry mean)	4.7	4.2	4.2	4.3	4.0	3.6	3.8	4.0	4.2	3.7
Food, beverages	3.7	3.9	3.5	3.9	3.8	2.7	2.8	3.1	7.7	3.1
Textiles	5.0	4.6	4.5	4.9	4.1	5.1	4.8	5.9	5.5	5.4
Wood products	3.7	4.1	4.0	4.0	4.1	3.6	3.8	3.8	3.8	4.0
Paper products	3.8	3.7	3.7	3.7	3.1	2.5	2.6	2.6	2.8	2.9
Petroleum products	5.5	2.8	2.6	4.2	3.8	0.8	1.0	1.1	0.8	0.6
Chemicals	3.8	3.3	3.5	3.1	3.0	3.5	3.9	3.9	3.6	3.1
Rubber products	6.0	6.1	5.8	6.2	5.4	5.2	5.2	5.1	4.8	4.4
Plastics	4.7	4.6	4.5	4.4	4.2	3.7	4.0	4.3	4.1	3.7
Non-metallic mineral products	10.9	9.9	10.3	9.9	9.7	8.0	7.9	7.6	8.4	8.9
Basic metals	3.9	3.4	3.4	3.1	2.9	3.1	4.0	4.1	3.5	3.8
Metal products	2.7	2.1	2.1	2.1	2.0	3.1	3.3	3.5	3.6	2.8
Electronics-related machinery	2.9	2.1	2.4	2.1	2.1	2.0	2.2	2.5	2.3	2.1
Small Energy Users (8 industry mean)	2.9	2.6	2.5	2.5	2.6	1.9	2.3	2.0	2.1	1.9
Tobacco	6.9	6.6	5.7	6.4	7.1	1.6	2.1	1.1	1.1	1.2
Apparel	2.0	1.9	1.8	1.8	2.0	1.4	1.3	1.4	1.7	1.5
Leather, footwear	2.3	2.4	2.5	1.9	2.0	2.3	3.0	1.6	2.3	1.9
Publishing	2.1	1.8	1.8	1.7	1.9	1.7	1.6	1.6	1.4	2.0
General machinery	2.2	1.9	1.8	1.9	1.7	1.8	2.0	2.1	2.0	1.9
Motor vehicles	2.9	2.1	2.4	2.1	2.1	2.1	2.2	2.0	2.6	2.2
Other transport equipment	2.7	2.5	2.2	2.3	2.2	2.6	3.7	3.6	2.8	2.0
Miscellaneous & recycling	2.5	2.0	2.1	1.9	1.9	2.2	2.4	2.7	2.9	2.6

Note: This table includes plants with 20 or more paid workers and positive output, employee compensation, and fixed assets.

Source: Author's compilations from micro data underlying Department of Statistics (2002, various years)

Appendix Table 2b: Water Intensities in Medium-Large Plants with Viable Data (percent)

Industry	Majority-local plants					MNE plants				
	2000	2001	2002	2003	2004	2000	2001	2002	2003	2004
Manufacturing (20 industry mean)	0.32	0.22	0.22	0.20	0.21	0.16	0.20	0.22	0.22	0.18
Large Energy Users (12 industry mean)	0.38	0.25	0.24	0.23	0.24	0.20	0.24	0.26	0.27	0.21
Food, beverages	0.49	0.44	0.29	0.30	0.39	0.24	0.26	0.28	0.56	0.24
Textiles	0.46	0.51	0.46	0.41	0.36	0.54	0.57	0.64	0.46	0.29
Wood products	0.17	0.18	0.18	0.17	0.18	0.15	0.19	0.21	0.17	0.14
Paper products	0.29	0.16	0.23	0.18	0.15	0.10	0.14	0.11	0.12	0.12
Petroleum products	0.58	0.08	0.07	0.08	0.07	0.11	0.09	0.13	0.12	0.10
Chemicals	0.46	0.27	0.23	0.24	0.22	0.15	0.17	0.21	0.22	0.20
Rubber products	0.37	0.33	0.37	0.35	0.35	0.36	0.38	0.44	0.38	0.32
Plastics	0.43	0.30	0.28	0.31	0.30	0.20	0.29	0.18	0.28	0.26
Non-metallic mineral products	0.33	0.23	0.27	0.21	0.29	0.14	0.18	0.22	0.28	0.24
Basic metals	0.27	0.19	0.16	0.18	0.17	0.11	0.20	0.22	0.19	0.16
Metal products	0.33	0.15	0.17	0.15	0.17	0.16	0.26	0.34	0.32	0.26
Electronics-related machinery	0.36	0.20	0.21	0.18	0.18	0.15	0.16	0.17	0.16	0.15
Small Energy Users (8 industry mean)	0.23	0.17	0.18	0.16	0.17	0.09	0.14	0.15	0.14	0.15
Tobacco	0.10	0.14	0.08	0.08	0.08	0.05	0.09	0.03	0.09	0.10
Apparel	0.20	0.19	0.20	0.20	0.25	0.10	0.14	0.14	0.17	0.16
Leather, footwear	0.28	0.27	0.30	0.21	0.25	0.11	0.18	0.21	0.16	0.27
Publishing	0.23	0.15	0.15	0.14	0.14	0.06	0.20	0.31	0.18	0.17
General machinery	0.21	0.16	0.17	0.15	0.16	0.10	0.12	0.13	0.11	0.11
Motor vehicles	0.32	0.14	0.17	0.15	0.13	0.07	0.08	0.09	0.09	0.08
Other transport equipment	0.23	0.13	0.16	0.15	0.16	0.10	0.11	0.12	0.13	0.10
Miscellaneous & recycling	0.28	0.16	0.17	0.17	0.19	0.16	0.16	0.16	0.17	0.23

Note: This table includes plants with 20 or more paid workers and positive output, employee compensation, and fixed assets.

Source: Author's compilations from micro data underlying Department of Statistics (2002, various years)

Appendix Table 3a: Electricity Intensities in Medium-Large Plants with Viable Data (percent)

Industry	Majority-local plants					MNE plants				
	2000	2001	2002	2003	2004	2000	2001	2002	2003	2004
Manufacturing (20 industry mean)	2.35	1.93	1.91	1.85	1.75	2.01	2.22	2.23	2.36	1.99
Large Energy Users (12 industry mean)	2.80	2.29	2.26	2.21	2.05	2.40	2.63	2.68	2.92	2.38
Food, beverages	2.16	2.23	1.85	2.10	2.02	1.60	1.75	1.77	6.13	1.65
Textiles	3.02	2.78	2.81	2.74	2.40	3.55	3.68	4.20	3.92	4.02
Wood products	1.92	1.99	2.04	2.14	2.10	2.57	2.78	2.65	2.73	2.45
Paper products	2.44	2.16	2.14	2.10	1.90	1.83	1.94	2.00	2.02	2.18
Petroleum products	3.61	0.95	0.59	1.02	0.74	0.44	0.53	0.53	0.33	0.22
Chemicals	2.77	2.28	2.23	1.96	1.96	2.39	2.73	2.71	2.41	2.06
Rubber products	3.09	2.99	2.96	2.83	2.42	3.14	3.18	3.02	2.78	2.59
Plastics	4.15	4.03	3.95	3.79	3.61	3.36	3.63	3.87	3.66	3.30
Non-metallic mineral products	3.22	2.79	3.00	2.82	2.67	3.61	3.88	3.68	4.00	3.51
Basic metals	2.62	2.19	2.16	1.93	1.86	2.39	3.00	3.03	2.54	2.57
Metal products	2.06	1.31	1.32	1.32	1.24	2.12	2.47	2.50	2.50	2.06
Electronics-related machinery	2.58	1.74	2.01	1.78	1.67	1.83	2.04	2.27	2.00	1.89
Small Energy Users (8 industry mean)	1.67	1.38	1.39	1.31	1.29	1.43	1.60	1.56	1.51	1.41
Tobacco	0.48	0.56	0.36	0.42	0.41	1.11	1.32	0.81	0.88	0.94
Apparel	1.62	1.51	1.51	1.51	1.68	1.23	1.20	1.20	1.42	1.30
Leather, footwear	1.94	1.85	1.95	1.60	1.67	1.87	2.23	1.55	1.53	1.48
Publishing	1.71	1.39	1.42	1.37	1.32	1.52	1.39	1.53	1.31	1.58
General machinery	1.46	1.26	1.22	1.24	1.09	1.29	1.51	1.66	1.51	1.37
Motor vehicles	2.27	1.47	1.64	1.51	1.37	1.38	1.47	1.59	1.58	1.52
Other transport equipment	1.78	1.44	1.44	1.41	1.38	1.33	1.91	2.05	1.67	1.29
Miscellaneous & recycling	2.08	1.59	1.54	1.45	1.46	1.69	1.80	2.07	2.17	1.80

Note: This table includes plants with 20 or more paid workers and positive output, employee compensation, and fixed assets.

Source: Author's compilations from micro data underlying Department of Statistics (2002, various years)

Appendix Table 3b: Fuel Intensities in Medium-Large Plants with Viable Data (percent)

Industry	Majority-local plants					MNE plants				
	2000	2001	2002	2003	2004	2000	2001	2002	2003	2004
Manufacturing (20 industry mean)	1.66	1.67	1.63	1.73	1.72	0.93	0.97	0.95	1.03	1.01
Large Energy Users (12 industry mean)	1.92	1.93	1.94	2.09	1.98	1.21	1.16	1.29	1.32	1.35
Food, beverages	1.59	1.70	1.65	1.76	1.78	1.07	1.08	1.31	1.59	1.43
Textiles	1.98	1.78	1.64	2.19	1.71	1.58	1.12	1.73	1.56	1.33
Wood products	1.80	2.09	1.92	1.86	1.95	1.04	1.03	1.12	1.08	1.53
Paper products	1.35	1.57	1.58	1.59	1.24	0.69	0.65	0.62	0.81	0.75
Petroleum products	1.86	1.86	2.01	3.17	3.09	0.40	0.51	0.61	0.45	0.37
Chemicals	1.04	1.05	1.30	1.16	1.08	1.07	1.14	1.22	1.15	1.06
Rubber products	2.94	3.10	2.88	3.38	2.94	2.11	1.99	2.12	2.06	1.85
Plastics	0.58	0.55	0.59	0.59	0.59	0.30	0.39	0.46	0.48	0.38
Non-metallic mineral products	7.67	7.07	7.26	7.05	7.07	4.41	4.02	3.97	4.40	5.34
Basic metals	1.25	1.23	1.22	1.18	1.04	0.74	0.96	1.09	0.91	1.22
Metal products	0.67	0.81	0.81	0.80	0.77	0.95	0.84	0.96	1.10	0.74
Electronics-related machinery	0.30	0.39	0.40	0.30	0.46	0.18	0.19	0.23	0.25	0.25
Small Energy Users (8 industry mean)	1.27	1.26	1.16	1.19	1.32	0.51	0.68	0.45	0.59	0.50
Tobacco	6.41	6.05	5.38	6.00	6.66	0.46	0.75	0.25	0.23	0.24
Apparel	0.34	0.36	0.30	0.31	0.31	0.13	0.13	0.19	0.24	0.22
Leather, footwear	0.38	0.54	0.59	0.30	0.38	0.39	0.80	0.08	0.81	0.46
Publishing	0.38	0.38	0.40	0.33	0.57	0.19	0.20	0.11	0.11	0.44
General machinery	0.71	0.62	0.54	0.63	0.58	0.46	0.45	0.47	0.52	0.50
Motor vehicles	0.60	0.63	0.77	0.58	0.74	0.73	0.74	0.39	0.98	0.66
Other transport equipment	0.88	1.11	0.77	0.86	0.84	1.22	1.76	1.53	1.09	0.75
Miscellaneous & recycling	0.46	0.42	0.55	0.49	0.48	0.52	0.62	0.62	0.74	0.75

Note: This table includes plants with 20 or more paid workers and positive output, employee compensation, and fixed assets.

Source: Author's compilations from micro data underlying Department of Statistics (2002, various years)

Appendix Table 4: Estimates of MNE-Local Energy and Water Intentisty Differentials and Related Details for Large Energy Using Industries Combined (all p-values based on robust standard errors [clustered by plant for random effects])

Indepen-dent variable, statistic	2000-2002				2002-2004				2000-2004			
	Pooled		Rand. Effects		Pooled		Rand. Effects		Pooled		Rand. Effects	
	Value	P-val.	Value	P-val.	Value	P-val.	Value	P-val.	Value	P-val.	Value	P-val.
TOTAL ENERGY INTENSITIES, 12 LARGE ENERGY USING INDUSTRIES COMBINED												
LE_{it}	1.5117	0.00	1.2047	0.00	1.6296	0.00	1.5916	0.00	1.5325	0.00	1.3025	0.00
LK_{it}	0.5970	0.00	0.3618	0.00	0.4804	0.00	0.3801	0.00	0.5381	0.00	0.3739	0.00
LM_{it}	-1.8237	0.00	-1.5175	0.00	-1.7649	0.00	-1.7451	0.00	-1.7797	0.00	-1.6398	0.00
ES_{it}	0.0197	0.00	0.0146	0.00	0.0109	0.01	0.0149	0.01	0.0150	0.00	0.0161	0.00
RD_{it}	-0.0484	0.26	-0.0566	0.45	0.0079	0.82	0.0270	0.45	-0.0248	0.38	0.0075	0.82
DF_{it}	-0.0600	0.50	-0.0328	0.73	0.4269	0.10	0.4863	0.10	0.1727	0.27	0.1521	0.31
Obs./R^2	16,774	0.28	16,774	0.27	16,179	0.23	16,179	0.22	27,511	0.24	27,511	0.23
B-P REtest	-	-	6,275	0.00	-	-	3,306	0.00	-	-	12,330	0.00
ELECTRICITY INTENSITIES, 12 LARGE ENERGY USING INDUSTRIES COMBINED												
LE_{it}	0.6529	0.00	0.6052	0.00	0.7833	0.00	0.8189	0.00	0.7006	0.00	0.6737	0.00
LK_{it}	0.3892	0.00	0.2297	0.00	0.3329	0.00	0.2873	0.00	0.3578	0.00	0.2865	0.00
LM_{it}	-0.9973	0.00	-0.8597	0.00	-1.0551	0.00	-1.0682	0.00	-1.0191	0.00	-0.9868	0.00
ES_{it}	0.0203	0.00	0.0130	0.00	0.0120	0.00	0.0133	0.00	0.0158	0.00	0.0164	0.00
RD_{it}	-0.0001	1.00	-0.0174	0.79	0.0095	0.70	0.0179	0.00	-0.0074	0.70	0.0082	0.70
DF_{it}	0.1391	0.03	0.0049	0.95	0.6080	0.01	0.6236	0.00	0.3635	0.01	0.2351	0.10
Obs./R^2	16,774	0.18	16,774	0.17	16,774	0.11	16,774	0.11	16,774	0.12	16,774	0.12
B-P REtest	-	-	6,174	0.00	-	-	1,650	0.00	-	-	7,930	0.00
FUEL INTENSITIES, 12 LARGE ENERGY USING INDUSTRIES COMBINED												
LE_{it}	0.8358	0.00	0.6410	0.00	0.8283	0.00	0.6146	0.00	0.8109	0.00	0.5422	0.00
LK_{it}	0.2111	0.00	0.1294	0.00	0.1493	0.00	0.0768	0.00	0.1827	0.00	0.0854	0.00
LM_{it}	-0.8100	0.00	-0.6809	0.00	-0.6951	0.00	-0.6034	0.00	-0.7446	0.00	-0.6054	0.00
ES_{it}	-0.0012	0.57	0.0002	0.94	-0.0020	0.30	0.0028	0.16	-0.0017	0.28	0.0009	0.60
RD_{it}	-0.0502	0.02	-0.0431	0.25	-0.0009	0.97	0.0003	0.98	-0.0176	0.41	-0.0030	0.91
DF_{it}	-0.2089	0.00	-0.0588	0.32	-0.1894	0.00	-0.0501	0.54	-0.1994	0.00	0.0118	0.83
Obs./R^2	16,774	0.26	16,774	0.25	16,179	0.28	16,179	0.28	27,511	0.26	27,511	0.26
B-P REtest	-	-	6,060	0.00	-	-	8,290	0.00	-	-	19,803	0.00
WATER INTENSITIES, 12 LARGE ENERGY USING INDUSTRIES COMBINED												
LE_{it}	0.0571	0.00	0.0477	0.00	0.0878	0.00	0.0793	0.00	0.0670	0.00	0.0487	0.00
LK_{it}	0.0246	0.00	0.0249	0.00	0.0206	0.00	0.0184	0.00	0.0230	0.00	0.0214	0.00
LM_{it}	-0.0991	0.00	-0.0923	0.00	-0.1127	0.00	-0.1112	0.00	-0.1031	0.00	-0.0926	0.00
ES_{it}	0.0032	0.00	0.0032	0.00	0.0024	0.00	0.0021	0.00	0.0027	0.00	0.0025	0.00
RD_{it}	-0.0015	0.64	-0.0156	0.31	0.0019	0.55	-0.0006	0.83	-0.0004	0.86	-0.0070	0.19
DF_{it}	-0.0628	0.00	-0.0845	0.00	0.0179	0.24	0.0250	0.17	-0.0297	0.01	-0.0544	0.00
Obs./R^2	16,774	0.06	16,774	0.05	16,179	0.07	16,179	0.07	27,511	0.06	27,511	0.06
B-P REtest	-	-	959	0.00	-	-	1,201	0.00	-	-	2,745	0.00

Appendix Table 4 (continued)

Indepen-dent variable, statistic	2000-2002				2002-2004				2000-2004			
	Pooled		Rand. Effects		Pooled		Rand. Effects		Pooled		Rand. Effects	
	Value	P-val.	Value	P-val.	Value	P-val.	Value	P-val.	Value	P-val.	Value	P-val.
TOTAL ENERGY INTENSITIES, 11 LARGE ENERGY USING INDUSTRIES COMBINED												
LE_{it}	1.5215	0.00	1.2134	0.00	1.6441	0.00	1.6044	0.00	1.5445	0.00	1.3125	0.00
LK_{it}	0.5982	0.00	0.3614	0.00	0.4819	0.00	0.3813	0.00	0.5394	0.00	0.3745	0.00
LM_{it}	-1.8326	0.00	-1.5217	0.00	-1.7776	0.00	-1.7556	0.00	-1.7901	0.00	-1.6470	0.00
ES_{it}	0.0202	0.00	0.0143	0.00	0.0111	0.01	0.0151	0.01	0.0153	0.00	0.0162	0.00
RD_{it}	-0.0591	0.16	-0.0609	0.43	-0.0008	0.98	0.0244	0.49	-0.0316	0.27	0.0059	0.86
DF_{it}	-0.0587	0.51	-0.0175	0.86	0.4310	0.10	0.4885	0.09	0.1760	0.26	0.1588	0.29
Obs./R^2	16,691	0.28	16,691	0.27	16,107	0.23	16,107	0.22	27,376	0.24	27,376	0.24
B-P REtest	-	-	6,238	0.00	-	-	3,280	0.00	-	-	12,238	0.00
ELECTRICITY INTENSITIES, 11 LARGE ENERGY USING INDUSTRIES COMBINED												
LE_{it}	0.6556	0.00	0.6091	0.00	0.7906	0.00	0.8255	0.00	0.7047	0.00	0.6769	0.00
LK_{it}	0.3890	0.00	0.2295	0.00	0.3329	0.00	0.2873	0.00	0.3578	0.00	0.2865	0.00
LM_{it}	-1.0008	0.00	-0.8638	0.00	-1.0630	0.00	-1.0757	0.00	-1.0244	0.00	-0.9917	0.00
ES_{it}	0.0205	0.00	0.0127	0.00	0.0118	0.00	0.0132	0.00	0.0159	0.00	0.0164	0.00
RD_{it}	0.0000	1.00	-0.0180	0.78	0.0094	0.70	0.0181	0.50	-0.0073	0.70	0.0085	0.70
DF_{it}	0.1432	0.03	0.0232	0.74	0.6106	0.01	0.6253	0.02	0.3669	0.01	0.2420	0.09
Obs./R^2	16,691	0.18	16,691	0.17	16,107	0.11	16,107	0.11	27,376	0.12	27,376	0.12
B-P REtest	-	-	6,170	0.00	-	-	1,640	0.00	-	-	7,902	0.00
FUEL INTENSITIES, 11 LARGE ENERGY USING INDUSTRIES COMBINED												
LE_{it}	0.8430	0.00	0.6476	0.00	0.8359	0.00	0.6179	0.00	0.8189	0.00	0.5467	0.00
LK_{it}	0.2126	0.00	0.1296	0.00	0.1510	0.00	0.0777	0.00	0.1841	0.00	0.0859	0.00
LM_{it}	-0.8155	0.00	-0.6824	0.00	-0.7002	0.00	-0.6048	0.00	-0.7499	0.00	-0.6062	0.00
ES_{it}	-0.0009	0.67	0.0001	0.97	-0.0016	0.41	0.0029	0.14	-0.0014	0.39	0.0010	0.54
RD_{it}	-0.0612	0.00	-0.0473	0.22	-0.0098	0.71	-0.0001	0.99	-0.0246	0.25	-0.0042	0.87
DF_{it}	-0.2114	0.00	-0.0610	0.31	-0.1878	0.00	-0.0494	0.55	-0.1993	0.00	0.0097	0.86
Obs./R^2	16,691	0.26	16,691	0.25	16,107	0.29	16,107	0.28	27,376	0.29	27,376	0.26
B-P REtest	-	-	6,017	0.00	-	-	8,252	0.00	-	-	19,681	0.00
WATER INTENSITIES, 11 LARGE ENERGY USING INDUSTRIES COMBINED												
LE_{it}	0.0570	0.00	0.0471	0.00	0.0885	0.00	0.0800	0.00	0.0671	0.00	0.0484	0.00
LK_{it}	0.0247	0.00	0.0250	0.00	0.0205	0.00	0.0184	0.00	0.0231	0.00	0.0216	0.00
LM_{it}	-0.0995	0.00	-0.0927	0.00	-0.1135	0.00	-0.1120	0.00	-0.1037	0.00	-0.0931	0.00
ES_{it}	0.0032	0.00	0.0032	0.00	0.0024	0.00	0.0021	0.00	0.0027	0.00	0.0025	0.00
RD_{it}	-0.0013	0.70	-0.0157	0.32	0.0021	0.53	-0.0005	0.84	-0.0003	0.91	-0.0070	0.19
DF_{it}	-0.0624	0.00	-0.0826	0.00	0.0175	0.25	0.0245	0.17	-0.0296	0.01	-0.0531	0.00
Obs./R^2	16,691	0.06	16,691	0.05	16,107	0.07	16,107	0.07	27,376	0.06	27,376	0.06
B-P REtest	-	-	955	0.00	-	-	1,195	0.00	-	-	2,738	0.00

Notes: 11 energy-intensive industries excludes petroleum products because of its unusal characteristics (relatively small samples, high labor productivity, high capital intensity); all p-values based on robust standard errors [clustered by plant for random effects]); estimated equations also include year, state, and industry, dummies as relevant (see explanation in the text; detailed estimates including all dummies and the constant available from authors).

Appendix Table 5: Estimates of MNE-Local Energy and Water Intentisty Differentials and Related Details for Individual Large Energy Using Industries (all p-values based on robust standard errors [clustered by plant for random effects])

Indepen-dent variable, statistic	2000-2002				2002-2004				2000-2004			
	Pooled		Rand. Effects		Pooled		Rand. Effects		Pooled		Rand. Effects	
	Value	P-val.	Value	P-val.	Value	P-val.	Value	P-val.	Value	P-val.	Value	P-val.
TOTAL ENERGY INTENSITIES, FOOD & BEVERAGES (MSIC 15)												
LE_{it}	1.1645	0.00	0.7352	0.00	1.3879	0.00	1.5876	0.00	1.2499	0.00	1.3106	0.00
LK_{it}	0.4703	0.00	0.1096	0.11	0.5116	0.00	0.4881	0.00	0.5108	0.00	0.4798	0.00
LM_{it}	-1.9359	0.00	-1.3218	0.00	-2.2809	0.00	-2.4444	0.00	-2.1528	0.00	-2.1937	0.00
ES_{it}	0.0321	0.00	0.0092	0.18	0.0136	0.25	0.0213	0.21	0.0264	0.00	0.0307	0.02
RD_{it}	-0.0907	0.28	-0.0895	0.21	-0.0604	0.05	-0.0465	0.04	-0.0701	0.05	-0.0571	0.05
DF_{it}	0.4585	0.02	0.1948	0.29	2.7791	0.18	2.9539	0.19	1.7783	0.15	1.6933	0.17
Obs./R^2	3,591	0.27	3,591	0.25	3,539	0.12	3,539	0.12	5,914	0.14	5,914	0.14
B-P REtest	-	-	1,607	0.00	-	-	110	0.00	-	-	715	0.00
ELECTRICITY INTENSITIES, FOOD & BEVERAGES (MSIC 15)												
LE_{it}	0.6751	0.00	0.5627	0.00	0.8633	0.00	1.0373	0.00	0.7781	0.00	0.8403	0.00
LK_{it}	0.3573	0.00	0.1364	0.02	0.4047	0.00	0.3997	0.00	0.3957	0.00	0.3877	0.00
LM_{it}	-1.2506	0.00	-0.9107	0.00	-1.6588	0.00	-1.8140	0.01	-1.5168	0.00	-1.5666	0.00
ES_{it}	0.0361	0.00	0.0094	0.08	0.0205	0.05	0.0252	0.09	0.0311	0.00	0.0328	0.01
RD_{it}	-0.0333	0.49	-0.0328	0.46	-0.0338	0.08	-0.0281	0.08	-0.0352	0.07	-0.0303	0.09
DF_{it}	0.2315	0.12	0.1502	0.26	2.3882	0.22	2.5627	0.23	1.4678	0.21	1.4222	0.23
Obs./R^2	3,591	0.18	3,591	0.16	3,539	0.07	3,539	0.07	5,914	0.08	5,914	0.08
B-P REtest	-	-	1,375	0.00	-	-	72.46	0.00	-	-	508	0.00
FUEL INTENSITIES, FOOD & BEVERAGES (MSIC 15)												
LE_{it}	0.4155	0.00	0.2908	0.00	0.4578	0.00	0.5419	0.00	0.4036	0.00	0.4026	0.00
LK_{it}	0.1069	0.00	0.0034	0.93	0.1006	0.00	0.0589	0.14	0.1105	0.00	0.0420	0.13
LM_{it}	-0.6306	0.00	-0.5106	0.00	-0.5691	0.00	-0.6127	0.00	-0.5871	0.00	-0.5711	0.00
ES_{it}	-0.0057	0.13	-0.0012	0.73	-0.0091	0.02	0.0006	0.88	-0.0065	0.03	0.0029	0.39
RD_{it}	-0.0599	0.14	-0.0498	0.14	-0.0270	0.05	-0.0112	0.08	-0.0356	0.05	-0.0178	0.05
DF_{it}	0.2191	0.04	0.1303	0.31	0.3810	0.01	0.3300	0.05	0.3030	0.00	0.1326	0.28
Obs./R^2	3,591	0.18	3,591	0.17	3,539	0.19	3,539	0.18	5,914	0.18	5,914	0.17
B-P REtest	-	-	1,551	0.00	-	-	1,296	0.00	-	-	4,005	0.00
WATER INTENSITIES, FOOD & BEVERAGES (MSIC 15)												
LE_{it}	0.0758	0.00	0.0850	0.00	0.1372	0.00	0.1567	0.00	0.1039	0.00	0.1166	0.00
LK_{it}	0.0242	0.01	0.0229	0.03	0.0221	0.00	0.0333	0.03	0.0244	0.00	0.0281	0.01
LM_{it}	-0.1504	0.00	-0.1554	0.00	-0.2035	0.00	-0.2381	0.00	-0.1749	0.00	-0.1955	0.00
ES_{it}	0.0090	0.00	0.0094	0.00	0.0070	0.00	0.0066	0.01	0.0076	0.00	0.0080	0.00
RD_{it}	-0.0107	0.24	-0.0149	0.23	-0.0049	0.02	-0.0034	0.03	-0.0061	0.03	-0.0046	0.04
DF_{it}	-0.0481	0.14	-0.0545	0.08	0.1351	0.21	0.1601	0.17	0.0453	0.50	0.0313	0.60
Obs./R^2	3,591	0.07	3,591	0.07	3,539	0.08	3,539	0.08	5,914	0.07	5,914	0.07
B-P REtest	-	-	101	0.00	-	-	79.37	0.00	-	-	289	0.00

Appendix Table 5 (continued)

Indepen-dent variable, statistic	2000-2002				2002-2004				2000-2004			
	Pooled		Rand. Effects		Pooled		Rand. Effects		Pooled		Rand. Effects	
	Value	P-val.	Value	P-val.	Value	P-val.	Value	P-val.	Value	P-val.	Value	P-val.
TOTAL ENERGY INTENSITIES, TEXTILES (MSIC 17)												
LE_{it}	1.2193	0.00	1.0044	0.00	1.1801	0.00	1.0035	0.03	1.1033	0.00	0.5634	0.15
LK_{it}	0.4593	0.00	0.1224	0.22	0.4940	0.00	0.1435	0.16	0.4643	0.00	0.0545	0.50
LM_{it}	-1.1869	0.00	-0.8972	0.00	-1.0209	0.00	-0.4656	0.31	-1.0342	0.00	-0.4425	0.24
ES_{it}	0.0804	0.01	0.0247	0.33	0.0783	0.00	0.0792	0.00	0.0794	0.00	0.0339	0.04
RD_{it}	0.2591	0.12	0.0551	0.17	0.3003	0.28	-0.5002	0.00	0.2167	0.15	-0.1053	0.45
DF_{it}	-0.0734	0.85	0.7605	0.10	0.1662	0.70	0.0575	0.93	-0.0771	0.81	0.5267	0.16
Obs./R^2	535	0.29	535	0.24	497	0.32	497	0.27	862	0.28	862	0.19
B-P REtest	-	-	145	0.00	-	-	148	0.00	-	-	452	0.00
ELECTRICITY INTENSITIES, TEXTILES (MSIC 17)												
LE_{it}	1.0697	0.00	0.7323	0.01	0.9096	0.00	0.6949	0.02	0.8895	0.00	0.3893	0.19
LK_{it}	0.2511	0.00	0.0639	0.38	0.3098	0.00	0.0804	0.24	0.2743	0.00	0.0662	0.28
LM_{it}	-0.7993	0.00	-0.4686	0.02	-0.7486	0.00	-0.3722	0.21	-0.7024	0.00	-0.2945	0.26
ES_{it}	0.0307	0.02	0.0200	0.16	0.0185	0.18	0.0213	0.06	0.0260	0.01	0.0157	0.10
RD_{it}	0.0636	0.53	0.0232	0.45	0.1352	0.27	-0.1873	0.16	0.0601	0.52	-0.0166	0.80
DF_{it}	0.1816	0.54	0.3577	0.28	0.4981	0.11	0.4548	0.29	0.2635	0.25	0.3688	0.17
Obs./R^2	535	0.31	535	0.29	497	0.35	497	0.30	862	0.31	862	0.25
B-P REtest	-	-	287	0.00	-	-	253	0.00	-	-	777	0.00
FUEL INTENSITIES, TEXTILES (MSIC 17)												
LE_{it}	0.1195	0.51	0.3118	0.16	0.2404	0.11	0.1975	0.44	0.1790	0.16	0.2186	0.14
LK_{it}	0.2065	0.00	0.0744	0.05	0.1838	0.00	0.0331	0.43	0.1882	0.00	-0.0005	0.99
LM_{it}	-0.3613	0.04	-0.4379	0.02	-0.2445	0.02	0.0172	0.94	-0.2998	0.01	-0.1230	0.32
ES_{it}	0.0499	0.02	0.0064	0.71	0.0600	0.00	0.0574	0.00	0.0535	0.00	0.0190	0.05
RD_{it}	0.1971	0.01	0.0319	0.23	0.1683	0.36	-0.3293	0.00	0.1574	0.02	-0.0908	0.27
DF_{it}	-0.2891	0.29	0.3806	0.13	-0.3697	0.22	-0.4346	0.30	-0.3782	0.08	0.1648	0.51
Obs./R^2	535	0.16	535	0.11	497	0.17	497	0.14	862	0.15	862	0.09
B-P REtest	-	-	107	0.00	-	-	127	0.00	-	-	361	0.00
WATER INTENSITIES, TEXTILES (MSIC 17)												
LE_{it}	0.1850	0.00	0.0921	0.08	0.1001	0.04	0.0947	0.13	0.1293	0.00	0.0897	0.13
LK_{it}	0.0063	0.79	0.0271	0.05	0.0463	0.00	0.0259	0.11	0.0257	0.08	0.0224	0.11
LM_{it}	-0.1834	0.00	-0.1455	0.00	-0.1325	0.00	-0.0971	0.01	-0.1545	0.00	-0.1161	0.00
ES_{it}	0.0063	0.06	0.0013	0.79	0.0037	0.32	0.0036	0.39	0.0057	0.03	0.0027	0.45
RD_{it}	0.0584	0.07	0.0053	0.76	0.0670	0.11	-0.0814	0.16	0.0491	0.07	-0.0195	0.41
DF_{it}	0.1800	0.17	0.0891	0.50	0.0830	0.33	0.1388	0.28	0.1045	0.24	0.0890	0.49
Obs./R^2	535	0.09	535	0.08	497	0.09	497	0.06	862	0.08	862	0.07
B-P REtest	-	-	296	0.00	-	-	59.56	0.00	-	-	313	0.00

Appendix Table 5 (continued)

Indepen-dent variable, statistic	2000-2002				2002-2004				2000-2004			
	Pooled		Rand. Effects		Pooled		Rand. Effects		Pooled		Rand. Effects	
	Value	P-val.	Value	P-val.	Value	P-val.	Value	P-val.	Value	P-val.	Value	P-val.
TOTAL ENERGY INTENSITIES, WOOD PRODUCTS (MSIC 20)												
LE_{it}	1.4005	0.00	1.4344	0.00	1.6625	0.00	1.2837	0.00	1.4711	0.00	1.2653	0.00
LK_{it}	0.4644	0.00	0.3853	0.00	0.4916	0.00	0.4763	0.00	0.4763	0.00	0.3902	0.00
LM_{it}	-1.7692	0.00	-1.8153	0.00	-1.8740	0.00	-1.7555	0.00	-1.7972	0.00	-1.8302	0.00
ES_{it}	0.0521	0.00	0.0379	0.00	0.0417	0.00	0.0266	0.02	0.0493	0.00	0.0307	0.00
RD_{it}	0.0209	0.97	0.2059	0.74	-0.0479	0.55	0.0265	0.51	-0.0580	0.80	0.0603	0.76
DF_{it}	-0.1510	0.49	-0.1119	0.68	-0.2416	0.26	0.0200	0.95	-0.1772	0.30	0.1117	0.61
Obs./R^2	1,983	0.18	1,983	0.18	1,789	0.24	1,789	0.24	3,154	0.20	3,154	0.19
B-P REtest	-	-	193	0.00	-	-	410	0.00	-	-	701	0.00
ELECTRICITY INTENSITIES, WOOD PRODUCTS (MSIC 20)												
LE_{it}	0.8986	0.00	1.0223	0.00	1.0179	0.00	0.7018	0.00	0.9237	0.00	0.7858	0.00
LK_{it}	0.3330	0.00	0.2296	0.01	0.4228	0.00	0.3694	0.00	0.3677	0.00	0.2670	0.00
LM_{it}	-0.9460	0.00	-1.0694	0.00	-1.1647	0.00	-1.0352	0.00	-1.0258	0.00	-1.0888	0.00
ES_{it}	0.0536	0.00	0.0335	0.00	0.0478	0.00	0.0288	0.00	0.0528	0.00	0.0303	0.00
RD_{it}	0.3375	0.53	0.5013	0.35	-0.0697	0.40	-0.0006	0.99	0.0549	0.79	0.1604	0.35
DF_{it}	0.4311	0.02	0.4078	0.04	0.3009	0.10	0.5214	0.05	0.3828	0.01	0.4361	0.03
Obs./R^2	1,983	0.19	1,983	0.18	1,789	0.18	1,789	0.17	3,154	0.18	3,154	0.15
B-P REtest	-	-	602	0.00	-	-	420	0.00	-	-	1,409	0.00
FUEL INTENSITIES, WOOD PRODUCTS (MSIC 20)												
LE_{it}	0.5848	0.00	0.5541	0.03	0.7390	0.00	0.6487	0.00	0.6304	0.00	0.5174	0.01
LK_{it}	0.1470	0.00	0.1254	0.03	0.0847	0.00	0.1383	0.00	0.1235	0.00	0.1173	0.00
LM_{it}	-0.9173	0.00	-0.9129	0.00	-0.8122	0.00	-0.8523	0.00	-0.8641	0.00	-0.8568	0.00
ES_{it}	0.0003	0.96	-0.0034	0.67	-0.0046	0.43	-0.0001	0.99	-0.0018	0.73	-0.0021	0.76
RD_{it}	-0.3195	0.06	-0.2587	0.09	0.0254	0.69	0.0296	0.47	-0.1144	0.17	-0.0945	0.24
DF_{it}	-0.5889	0.00	-0.5337	0.00	-0.5554	0.00	-0.4869	0.03	-0.5686	0.00	-0.3215	0.02
Obs./R^2	1,983	0.16	1,983	0.16	1,789	0.26	1,789	0.26	3,154	0.18	3,154	0.18
B-P REtest	-	-	160	0.00	-	-	723	0.00	-	-	663	0.00
WATER INTENSITIES, WOOD PRODUCTS (MSIC 20)												
LE_{it}	0.0363	0.01	0.0319	0.09	0.0573	0.00	0.0493	0.01	0.0431	0.00	0.0251	0.12
LK_{it}	0.0202	0.00	0.0196	0.00	0.0267	0.00	0.0243	0.00	0.0232	0.00	0.0226	0.00
LM_{it}	-0.0635	0.00	-0.0658	0.00	-0.0775	0.00	-0.0750	0.00	-0.0696	0.00	-0.0718	0.00
ES_{it}	0.0046	0.00	0.0035	0.07	0.0013	0.14	0.0019	0.07	0.0036	0.00	0.0035	0.02
RD_{it}	-0.0131	0.61	0.0021	0.92	-0.0043	0.69	0.0006	0.91	-0.0157	0.19	-0.0047	0.59
DF_{it}	0.0006	0.98	-0.0012	0.96	-0.0054	0.84	0.0013	0.96	-0.0063	0.74	-0.0079	0.72
Obs./R^2	1,983	0.10	1,983	0.09	1,789	0.11	1,789	0.10	3,154	0.09	3,154	0.08
B-P REtest	-	-	242	0.00	-	-	361	0.00	-	-	733	0.00

Appendix Table 5 (continued)

Indepen-dent variable, statistic	2000-2002				2002-2004				2000-2004			
	Pooled		Rand. Effects		Pooled		Rand. Effects		Pooled		Rand. Effects	
	Value	P-val.	Value	P-val.	Value	P-val.	Value	P-val.	Value	P-val.	Value	P-val.
TOTAL ENERGY INTENSITIES, PAPER PRODUCTS (MSIC 21)												
LE_{it}	2.5251	0.00	1.3611	0.00	1.6282	0.00	1.1500	0.00	2.0072	0.00	0.5385	0.04
LK_{it}	1.0991	0.00	0.6736	0.00	1.0193	0.00	0.3745	0.00	1.0179	0.00	0.3864	0.00
LM_{it}	-3.2342	0.00	-1.8445	0.00	-2.2944	0.00	-1.5089	0.00	-2.6423	0.00	-1.1920	0.00
ES_{it}	0.0070	0.75	0.0135	0.35	-0.0324	0.05	-0.0132	0.48	-0.0055	0.71	0.0189	0.07
RD_{it}	0.7651	0.43	0.2565	0.22	0.6800	0.20	0.2971	0.34	0.7554	0.13	0.1782	0.43
DF_{it}	-0.1482	0.64	-0.4053	0.16	0.2840	0.33	0.0914	0.77	0.0497	0.83	-0.0999	0.58
Obs./R^2	709	0.26	709	0.23	706	0.25	706	0.19	1,190	0.25	1,190	0.17
B-P REtest	-	-	310	0.00	-	-	308	0.00	-	-	868	0.00
ELECTRICITY INTENSITIES, PAPER PRODUCTS (MSIC 21)												
LE_{it}	0.9940	0.00	0.2076	0.42	0.7936	0.00	0.7519	0.00	0.8699	0.00	0.0943	0.65
LK_{it}	0.6111	0.00	0.3539	0.00	0.5978	0.00	0.2836	0.00	0.5859	0.00	0.2584	0.00
LM_{it}	-1.4947	0.00	-0.5874	0.01	-1.3736	0.00	-1.0792	0.00	-1.3982	0.00	-0.6088	0.00
ES_{it}	0.0076	0.57	0.0185	0.07	-0.0116	0.24	0.0067	0.28	0.0016	0.86	0.0189	0.01
RD_{it}	0.8848	0.13	0.1294	0.32	0.6590	0.21	0.1582	0.62	0.7070	0.09	0.1289	0.57
DF_{it}	0.1148	0.60	-0.1636	0.26	0.5593	0.01	0.3529	0.08	0.3271	0.05	-0.0141	0.91
Obs./R^2	709	0.18	709	0.15	706	0.20	706	0.17	1,190	0.19	1,190	0.13
B-P REtest	-	-	380	0.00	-	-	371	0.00	-	-	1,072	0.00
FUEL INTENSITIES, PAPER PRODUCTS (MSIC 21)												
LE_{it}	1.1823	0.01	0.8931	0.01	0.5761	0.00	0.3186	0.12	0.8510	0.00	0.3636	0.01
LK_{it}	0.4220	0.00	0.2577	0.00	0.3770	0.00	0.1361	0.00	0.3776	0.00	0.1223	0.00
LM_{it}	-1.3231	0.00	-0.9367	0.01	-0.6206	0.00	-0.3496	0.03	-0.9066	0.00	-0.4720	0.01
ES_{it}	-0.0080	0.56	-0.0065	0.44	-0.0256	0.00	-0.0219	0.15	-0.0128	0.16	-0.0012	0.82
RD_{it}	-0.0909	0.86	0.0967	0.58	-0.0388	0.90	0.1387	0.06	0.0248	0.93	0.0561	0.51
DF_{it}	-0.3044	0.07	-0.2382	0.16	-0.3103	0.03	-0.2612	0.14	-0.3146	0.01	-0.0976	0.42
Obs./R^2	709	0.22	709	0.19	706	0.25	706	0.22	1,190	0.22	1,190	0.16
B-P REtest	-	-	177	0.00	-	-	243	0.00	-	-	526	0.00
WATER INTENSITIES, PAPER PRODUCTS (MSIC 21)												
LE_{it}	0.0513	0.27	-0.0196	0.69	0.0892	0.03	0.0732	0.06	0.0577	0.06	-0.0278	0.48
LK_{it}	0.0530	0.00	0.0331	0.01	0.0284	0.02	0.0004	0.95	0.0391	0.00	0.0062	0.49
LM_{it}	-0.1286	0.01	-0.0551	0.21	-0.1113	0.00	-0.0682	0.05	-0.1144	0.00	-0.0171	0.58
ES_{it}	0.0062	0.00	0.0052	0.02	0.0029	0.07	0.0026	0.11	0.0044	0.00	0.0030	0.02
RD_{it}	0.0079	0.89	-0.0392	0.12	-0.0349	0.37	-0.0341	0.47	-0.0158	0.60	-0.0346	0.20
DF_{it}	-0.0874	0.01	-0.1027	0.00	-0.0425	0.08	-0.0122	0.68	-0.0604	0.00	-0.0468	0.06
Obs./R^2	709	0.09	709	0.08	706	0.09	706	0.08	1,190	0.08	1,190	0.06
B-P REtest	-	-	260	0.00	-	-	493	0.00	-	-	1,073	0.00

Appendix Table 5 (continued)

Indepen-dent variable, statistic	2000-2002				2002-2004				2000-2004			
	Pooled		Rand. Effects		Pooled		Rand. Effects		Pooled		Rand. Effects	
	Value	P-val.	Value	P-val.	Value	P-val.	Value	P-val.	Value	P-val.	Value	P-val.
TOTAL ENERGY INTENSITIES, CHEMICALS (MSIC 24)												
LE_{it}	1.1679	0.00	1.3378	0.00	1.2028	0.00	1.0719	0.01	1.2238	0.00	1.4391	0.00
LK_{it}	0.8675	0.00	0.5443	0.02	0.7159	0.00	0.5327	0.00	0.7417	0.00	0.3732	0.00
LM_{it}	-1.7159	0.00	-1.5400	0.00	-1.5260	0.00	-1.4921	0.00	-1.6213	0.00	-1.5005	0.00
ES_{it}	0.0098	0.51	0.0006	0.97	0.0017	0.86	0.0097	0.40	0.0072	0.44	0.0085	0.44
RD_{it}	-0.3244	0.13	-0.8852	0.32	-0.4122	0.00	-0.1064	0.16	-0.3497	0.01	-0.4272	0.27
DF_{it}	0.2187	0.53	0.1218	0.77	0.5290	0.10	0.3657	0.27	0.3558	0.18	0.1870	0.53
Obs./R^2	1,113	0.28	1,113	0.27	1,153	0.32	1,153	0.31	1,906	0.29	1,906	0.28
B-P REtest	-	-	422	0.00	-	-	788	0.00	-	-	1,737	0.00
ELECTRICITY INTENSITIES, CHEMICALS (MSIC 24)												
LE_{it}	1.0234	0.00	1.3492	0.00	0.9793	0.00	1.0013	0.00	1.0029	0.00	1.2756	0.00
LK_{it}	0.6586	0.00	0.3748	0.08	0.5652	0.00	0.4217	0.00	0.5792	0.00	0.2948	0.01
LM_{it}	-1.6600	0.00	-1.4900	0.00	-1.4577	0.00	-1.3849	0.00	-1.5453	0.00	-1.3873	0.00
ES_{it}	0.0247	0.07	0.0063	0.61	0.0147	0.05	0.0088	0.37	0.0209	0.01	0.0102	0.33
RD_{it}	-0.2368	0.15	-0.8843	0.32	-0.2452	0.01	-0.0121	0.80	-0.2290	0.02	-0.4050	0.29
DF_{it}	0.1686	0.58	0.1082	0.77	0.5547	0.03	0.3839	0.12	0.3227	0.14	0.1910	0.46
Obs./R^2	1,113	0.22	1,113	0.20	1,153	0.26	1,153	0.25	1,906	0.23	1,906	0.21
B-P REtest	-	-	426	0.00	-	-	934	0.00	-	-	1,782	0.00
FUEL INTENSITIES, CHEMICALS (MSIC 24)												
LE_{it}	0.1751	0.28	0.0140	0.95	0.2369	0.11	0.1199	0.63	0.2420	0.02	0.1581	0.29
LK_{it}	0.2239	0.00	0.1633	0.02	0.1568	0.00	0.1146	0.01	0.1720	0.00	0.0750	0.01
LM_{it}	-0.0893	0.32	-0.0588	0.57	-0.0790	0.32	-0.0976	0.36	-0.0967	0.10	-0.1156	0.13
ES_{it}	-0.0151	0.01	-0.0064	0.11	-0.0132	0.02	-0.0029	0.65	-0.0138	0.00	-0.0012	0.74
RD_{it}	-0.0920	0.11	-0.0126	0.60	-0.1741	0.00	-0.1012	0.01	-0.1267	0.00	-0.0194	0.29
DF_{it}	0.0624	0.76	0.0188	0.93	-0.0251	0.91	-0.0669	0.79	0.0397	0.81	-0.0045	0.98
Obs./R^2	1,113	0.17	1,113	0.17	1,153	0.18	1,153	0.17	1,906	0.18	1,906	0.17
B-P REtest	-	-	450	0.00	-	-	557	0.00	-	-	1,900	0.00
WATER INTENSITIES, CHEMICALS (MSIC 24)												
LE_{it}	0.0246	0.39	0.0333	0.43	0.0867	0.00	0.0551	0.03	0.0522	0.01	0.0526	0.08
LK_{it}	0.0762	0.08	0.0764	0.11	0.0261	0.00	0.0167	0.04	0.0498	0.02	0.0417	0.02
LM_{it}	-0.1028	0.02	-0.1021	0.05	-0.0821	0.00	-0.0665	0.00	-0.0932	0.00	-0.0838	0.00
ES_{it}	-0.0024	0.28	-0.0031	0.25	0.0006	0.40	0.0000	0.95	-0.0008	0.52	-0.0014	0.33
RD_{it}	-0.0311	0.04	-0.1775	0.29	-0.0151	0.09	0.0068	0.58	-0.0210	0.00	-0.0871	0.26
DF_{it}	-0.1456	0.02	-0.1678	0.03	-0.0169	0.48	-0.0145	0.54	-0.0981	0.01	-0.1043	0.04
Obs./R^2	1,113	0.03	1,113	0.03	1,153	0.14	1,153	0.13	1,906	0.04	1,906	0.03
B-P REtest	-	-	5.29	0.02	-	-	462	0.00	-	-	41.53	0.00

Appendix Table 5 (continued)

Independent variable, statistic	2000-2002				2002-2004				2000-2004			
	Pooled		Rand. Effects		Pooled		Rand. Effects		Pooled		Rand. Effects	
	Value	P-val.	Value	P-val.	Value	P-val.	Value	P-val.	Value	P-val.	Value	P-val.
TOTAL ENERGY INTENSITIES, RUBBER PRODUCTS (MSIC 251)												
LE_{it}	3.1513	0.00	2.1140	0.00	2.8407	0.00	2.0276	0.00	2.9623	0.00	1.7230	0.00
LK_{it}	-0.0076	0.88	0.0893	0.02	0.0079	0.88	0.0161	0.54	-0.0097	0.80	0.0446	0.13
LM_{it}	-1.7934	0.00	-1.8007	0.00	-1.4549	0.00	-1.3811	0.00	-1.5837	0.00	-1.5207	0.00
ES_{it}	-0.0399	0.01	-0.0090	0.63	-0.0220	0.09	0.0058	0.70	-0.0304	0.00	-0.0033	0.80
RD_{it}	-0.5973	0.00	-0.1118	0.44	-0.4436	0.04	-0.0395	0.51	-0.5476	0.00	-0.1257	0.16
DF_{it}	-0.8498	0.01	0.0548	0.92	-1.4139	0.00	-0.5438	0.13	-1.0906	0.00	0.0774	0.86
Obs./R^2	954	0.27	954	0.23	851	0.26	851	0.23	1,517	0.26	1,517	0.20
B-P REtest	-	-	380	0.00	-	-	389	0.00	-	-	1,051	0.00
ELECTRICITY INTENSITIES, RUBBER PRODUCTS (MSIC 251)												
LE_{it}	0.9645	0.00	0.7609	0.00	0.7987	0.00	0.7216	0.00	0.8585	0.00	0.6577	0.00
LK_{it}	0.0294	0.20	0.0478	0.03	0.0359	0.09	0.0163	0.32	0.0253	0.15	0.0216	0.19
LM_{it}	-1.0935	0.00	-1.1398	0.00	-0.8132	0.00	-0.8210	0.00	-0.9271	0.00	-0.9787	0.00
ES_{it}	-0.0052	0.54	0.0070	0.56	-0.0116	0.06	0.0052	0.49	-0.0076	0.16	0.0060	0.37
RD_{it}	-0.2091	0.00	0.0022	0.98	-0.1221	0.01	-0.0069	0.89	-0.1709	0.00	-0.0379	0.48
DF_{it}	0.2281	0.21	0.3134	0.20	0.1103	0.46	0.1338	0.48	0.1702	0.20	0.2314	0.22
Obs./R^2	954	0.28	954	0.27	851	0.30	851	0.28	1,517	0.27	1,517	0.25
B-P REtest	-	-	269	0.00	-	-	192	0.00	-	-	566	0.00
FUEL INTENSITIES, RUBBER PRODUCTS (MSIC 251)												
LE_{it}	2.2317	0.00	1.4113	0.00	2.0659	0.00	1.2697	0.00	2.1375	0.00	1.0725	0.00
LK_{it}	-0.0370	0.41	0.0424	0.06	-0.0276	0.51	0.0034	0.84	-0.0347	0.30	0.0243	0.19
LM_{it}	-0.7190	0.00	-0.6467	0.00	-0.6508	0.00	-0.5443	0.00	-0.6711	0.00	-0.5248	0.00
ES_{it}	-0.0353	0.01	-0.0157	0.25	-0.0107	0.35	-0.0021	0.85	-0.0232	0.01	-0.0091	0.36
RD_{it}	-0.3912	0.01	-0.1518	0.22	-0.3231	0.08	-0.0374	0.20	-0.3787	0.01	-0.0945	0.23
DF_{it}	-1.0879	0.00	-0.2794	0.46	-1.5334	0.00	-0.5811	0.07	-1.2693	0.00	-0.1338	0.67
Obs./R^2	954	0.21	954	0.18	851	0.19	851	0.17	1,517	0.19	1,517	0.14
B-P REtest	-	-	413	0.00	-	-	467	0.00	-	-	1,239	0.00
WATER INTENSITIES, RUBBER PRODUCTS (MSIC 251)												
LE_{it}	0.2248	0.00	0.1742	0.00	0.2194	0.00	0.1599	0.00	0.2193	0.00	0.1378	0.00
LK_{it}	0.0032	0.41	0.0116	0.00	0.0066	0.14	0.0060	0.16	0.0043	0.16	0.0114	0.00
LM_{it}	-0.1187	0.00	-0.1159	0.00	-0.1176	0.00	-0.1168	0.00	-0.1118	0.00	-0.1018	0.00
ES_{it}	0.0027	0.15	0.0030	0.20	-0.0008	0.58	0.0008	0.66	0.0006	0.60	0.0022	0.18
RD_{it}	-0.0284	0.10	0.0005	0.97	-0.0166	0.39	-0.0062	0.58	-0.0232	0.11	-0.0081	0.35
DF_{it}	-0.0028	0.94	0.0125	0.84	-0.0267	0.48	-0.0249	0.66	-0.0186	0.51	-0.0105	0.82
Obs./R^2	954	0.15	954	0.14	851	0.15	851	0.14	1,517	0.15	1,517	0.13
B-P REtest	-	-	318	0.00	-	-	175	0.00	-	-	602	0.00

Appendix Table 5 (continued)

Indepen-dent variable, statistic	2000-2002				2002-2004				2000-2004			
	Pooled		Rand. Effects		Pooled		Rand. Effects		Pooled		Rand. Effects	
	Value	P-val.	Value	P-val.	Value	P-val.	Value	P-val.	Value	P-val.	Value	P-val.
TOTAL ENERGY INTENSITIES, PLASTICS (MSIC 252)												
LE_{it}	3.1584	0.00	2.1229	0.00	2.8368	0.00	2.0258	0.00	0.4385	0.00	0.5623	0.00
LK_{it}	-0.0095	0.86	0.0878	0.02	0.0083	0.87	0.0167	0.52	0.3428	0.00	0.1602	0.01
LM_{it}	-1.7960	0.00	-1.8034	0.00	-1.4515	0.00	-1.3760	0.00	-1.1906	0.00	-1.1291	0.00
ES_{it}	-0.0399	0.01	-0.0091	0.62	-0.0220	0.09	0.0061	0.68	-0.0135	0.00	0.0068	0.20
RD_{it}	-0.5983	0.00	-0.1124	0.43	-0.4435	0.04	-0.0392	0.51	-0.0320	0.61	0.0794	0.06
DF_{it}	-0.8486	0.01	0.0579	0.91	-1.4156	0.00	-0.5463	0.13	0.0240	0.87	-0.1207	0.61
Obs./R^2	954	0.27	954	0.23	851	0.00	851	0.23	3,055	0.13	3,055	0.11
B-P REtest	-	-	379	0.00	-	-	388	0.00	-	-	1,066	0.00
ELECTRICITY INTENSITIES, PLASTICS (MSIC 252)												
LE_{it}	0.9573	0.00	0.7602	0.00	0.7872	0.00	0.7134	0.00	0.4604	0.00	0.4613	0.00
LK_{it}	0.0313	0.17	0.0480	0.03	0.0371	0.08	0.0176	0.28	0.2490	0.00	0.1176	0.05
LM_{it}	-1.0910	0.00	-1.1392	0.00	-0.8033	0.00	-0.8099	0.00	-1.0381	0.00	-0.9635	0.00
ES_{it}	-0.0052	0.54	0.0070	0.55	-0.0115	0.06	0.0060	0.43	-0.0133	0.00	0.0057	0.27
RD_{it}	-0.2082	0.00	0.0020	0.98	-0.1217	0.01	-0.0062	0.90	0.0008	0.99	0.0853	0.02
DF_{it}	0.2268	0.22	0.3125	0.20	0.1053	0.48	0.1297	0.49	0.1487	0.26	-0.0126	0.95
Obs./R^2	954	0.28	954	0.26	851	0.29	851	0.28	3,055	0.13	3,055	0.11
B-P REtest	-	-	270	0.00	-	-	191	0.00	-	-	796	0.00
FUEL INTENSITIES, PLASTICS (MSIC 252)												
LE_{it}	2.2464	0.00	1.4206	0.00	2.0739	0.00	1.2734	0.00	-0.0112	0.76	0.1094	0.15
LK_{it}	-0.0409	0.36	0.0408	0.07	-0.0284	0.50	0.0028	0.86	0.0985	0.00	0.0469	0.00
LM_{it}	-0.7244	0.00	-0.6500	0.00	-0.6577	0.00	-0.5493	0.00	-0.1711	0.00	-0.1842	0.01
ES_{it}	-0.0353	0.01	-0.0159	0.24	-0.0108	0.35	-0.0025	0.82	-0.0002	0.93	0.0012	0.55
RD_{it}	-0.3930	0.01	-0.1522	0.22	-0.3233	0.08	-0.0379	0.19	-0.0335	0.05	-0.0063	0.34
DF_{it}	-1.0853	0.00	-0.2753	0.47	-1.5298	0.00	-0.5817	0.07	-0.1247	0.05	-0.1036	0.18
Obs./R^2	954	0.20	954	0.18	851	0.19	851	0.17	3,055	0.03	3,055	0.03
B-P REtest	-	-	412	0.00	-	-	467	0.00	-	-	2,363	0.00
WATER INTENSITIES, PLASTICS (MSIC 252)												
LE_{it}	0.2220	0.00	0.1734	0.00	0.2178	0.00	0.1586	0.00	0.0030	0.84	-0.0206	0.36
LK_{it}	0.0039	0.30	0.0118	0.00	0.0068	0.13	0.0062	0.15	0.0156	0.01	0.0061	0.43
LM_{it}	-0.1176	0.00	-0.1156	0.00	-0.1162	0.00	-0.1151	0.00	-0.0844	0.00	-0.0492	0.00
ES_{it}	0.0027	0.15	0.0031	0.20	-0.0008	0.59	0.0009	0.62	0.0026	0.01	0.0026	0.05
RD_{it}	-0.0280	0.10	0.0005	0.97	-0.0166	0.39	-0.0061	0.58	-0.0142	0.04	-0.0042	0.52
DF_{it}	-0.0033	0.93	0.0120	0.84	-0.0274	0.47	-0.0256	0.65	-0.0469	0.04	-0.0669	0.05
Obs./R^2	954	0.15	954	0.14	851	0.15	851	0.14	3,055	0.07	3,055	0.06
B-P REtest	-	-	320	0.00	-	-	175	0.00	-	-	363	0.00

Appendix Table 5 (continued)

Indepen-dent variable, statistic	2000-2002				2002-2004				2000-2004			
	Pooled		Rand. Effects		Pooled		Rand. Effects		Pooled		Rand. Effects	
	Value	P-val.	Value	P-val.	Value	P-val.	Value	P-val.	Value	P-val.	Value	P-val.
TOTAL ENERGY INTENSITIES, NON-METALLIC MINERAL PRODUCTS (MSIC 26)												
LE_{it}	4.1106	0.00	3.2383	0.00	4.9056	0.00	3.0471	0.00	4.4079	0.00	2.8051	0.00
LK_{it}	2.2791	0.00	1.5586	0.00	1.5210	0.00	0.9997	0.00	1.9153	0.00	1.1688	0.00
LM_{it}	-5.1515	0.00	-3.9343	0.00	-4.5805	0.00	-3.1858	0.00	-4.8393	0.00	-3.5080	0.00
ES_{it}	0.0953	0.00	0.0342	0.23	0.0794	0.00	0.0447	0.02	0.0786	0.00	0.0232	0.28
RD_{it}	0.0388	0.82	-0.0721	0.69	-0.1911	0.69	0.0373	0.83	0.0262	0.87	0.0190	0.91
DF_{it}	-1.6691	0.02	-0.6604	0.34	-1.1930	0.09	0.3821	0.75	-1.2032	0.03	0.5199	0.46
Obs./R^2	1,315	0.00	1,315	0.34	1,244	0.38	1,244	0.36	2,138	0.35	2,138	0.32
B-P REtest	-	-	398	0.00	-	-	548	0.00	-	-	1,235	0.00
ELECTRICITY INTENSITIES, NON-METALLIC MINERAL PRODUCTS (MSIC 26)												
LE_{it}	0.6896	0.00	0.7276	0.00	1.0266	0.00	0.6183	0.00	0.8300	0.00	0.5164	0.00
LK_{it}	0.9618	0.00	0.5098	0.00	0.7166	0.00	0.3967	0.00	0.8211	0.00	0.4704	0.00
LM_{it}	-1.1126	0.00	-0.7114	0.00	-0.9723	0.00	-0.5824	0.00	-1.0109	0.00	-0.7094	0.00
ES_{it}	0.0204	0.02	0.0125	0.10	0.0174	0.04	0.0106	0.14	0.0177	0.01	0.0085	0.17
RD_{it}	-0.0198	0.70	0.0173	0.02	-0.1724	0.06	-0.0583	0.14	-0.0466	0.40	-0.0063	0.75
DF_{it}	-0.0306	0.91	-0.1893	0.55	-0.0402	0.88	0.3470	0.34	0.0146	0.94	0.0956	0.72
Obs./R^2	1,315	0.28	1,315	0.26	1,244	0.28	1,244	0.26	2,138	0.27	2,138	0.25
B-P REtest	-	-	831	0.00	-	-	779	0.00	-	-	2,356	0.00
FUEL INTENSITIES, NON-METALLIC MINERAL PRODUCTS (MSIC 26)												
LE_{it}	3.4854	0.00	2.7259	0.00	3.9704	0.00	2.3585	0.00	3.6388	0.00	2.3828	0.00
LK_{it}	1.4540	0.00	1.0682	0.00	0.8830	0.00	0.5889	0.00	1.1901	0.00	0.7315	0.00
LM_{it}	-4.1676	0.00	-3.3565	0.00	-3.6838	0.00	-2.5316	0.00	-3.9044	0.00	-2.8856	0.00
ES_{it}	0.0722	0.00	0.0226	0.38	0.0592	0.00	0.0320	0.04	0.0574	0.00	0.0142	0.46
RD_{it}	0.0577	0.66	-0.0800	0.66	-0.0386	0.93	0.0926	0.58	0.0676	0.58	0.0272	0.87
DF_{it}	-1.7141	0.01	-0.6300	0.36	-1.2451	0.04	0.0764	0.94	-1.2859	0.01	0.3596	0.55
Obs./R^2	1,315	0.30	1,315	0.29	1,244	0.32	1,244	0.29	2,138	0.30	2,138	0.27
B-P REtest	-	-	384	0.00	-	-	569	0.00	-	-	1,243	0.00
WATER INTENSITIES, NON-METALLIC MINERAL PRODUCTS (MSIC 26)												
LE_{it}	0.0661	0.04	0.0657	0.16	0.0463	0.16	0.0465	0.26	0.0529	0.04	0.0480	0.20
LK_{it}	0.0228	0.05	0.0230	0.08	0.0096	0.39	0.0079	0.55	0.0192	0.03	0.0206	0.07
LM_{it}	-0.1009	0.00	-0.1004	0.01	-0.0677	0.00	-0.0654	0.01	-0.0835	0.00	-0.0817	0.00
ES_{it}	0.0054	0.02	0.0054	0.10	0.0020	0.24	0.0017	0.41	0.0036	0.02	0.0033	0.10
RD_{it}	-0.0007	0.81	-0.0004	0.90	-0.0171	0.14	-0.0168	0.14	-0.0060	0.14	-0.0070	0.26
DF_{it}	-0.0964	0.00	-0.0978	0.03	-0.0137	0.74	-0.0072	0.90	-0.0609	0.04	-0.0659	0.13
Obs./R^2	1,315	0.02	1,315	0.02	1,244	0.01	1,244	0.01	2,138	0.02	2,138	0.02
B-P REtest	-	-	26.58	0.00	-	-	26.38	0.00	-	-	115	0.00

Appendix Table 5 (continued)

Independent variable, statistic	2000-2002				2002-2004				2000-2004			
	Pooled		Rand. Effects		Pooled		Rand. Effects		Pooled		Rand. Effects	
	Value	P-val.	Value	P-val.	Value	P-val.	Value	P-val.	Value	P-val.	Value	P-val.
TOTAL ENERGY INTENSITIES, BASIC METALS (MSIC 27)												
LE_{it}	1.9611	0.00	0.8505	0.00	1.8609	0.00	1.0427	0.00	1.8539	0.00	1.0034	0.00
LK_{it}	0.3690	0.00	0.3424	0.01	0.3929	0.00	0.3193	0.00	0.4064	0.00	0.3213	0.00
LM_{it}	-1.0002	0.00	-0.4083	0.03	-0.9664	0.00	-0.8287	0.00	-0.9712	0.00	-0.7107	0.00
ES_{it}	0.0216	0.17	-0.0084	0.64	0.0020	0.86	0.0016	0.87	0.0076	0.45	-0.0069	0.45
RD_{it}	-0.2354	0.01	-0.0223	0.48	-0.0353	0.36	-0.0244	0.38	-0.0411	0.34	0.0159	0.36
DF_{it}	-0.1404	0.69	0.1707	0.65	0.2592	0.46	0.4492	0.21	0.0083	0.98	0.1950	0.43
Obs./R^2	778	0.20	778	0.12	769	0.22	769	0.19	1,292	0.21	1,292	0.16
B-P REtest	-	-	452	0.00	-	-	467	0.00	-	-	1,311	0.00
ELECTRICITY INTENSITIES, BASIC METALS (MSIC 27)												
LE_{it}	1.2589	0.00	0.6206	0.01	1.2386	0.00	0.6364	0.00	1.1830	0.00	0.6132	0.00
LK_{it}	0.3160	0.00	0.2470	0.00	0.2928	0.00	0.2382	0.00	0.3277	0.00	0.2381	0.00
LM_{it}	-0.9033	0.00	-0.4272	0.01	-0.7892	0.00	-0.6061	0.00	-0.8324	0.00	-0.5262	0.00
ES_{it}	0.0269	0.01	0.0050	0.70	0.0084	0.30	0.0102	0.30	0.0136	0.05	0.0042	0.62
RD_{it}	-0.1733	0.00	-0.0050	0.69	-0.0095	0.74	-0.0004	0.98	-0.0198	0.55	0.0202	0.06
DF_{it}	0.2241	0.44	0.1300	0.64	0.4728	0.08	0.4095	0.17	0.3182	0.14	0.1680	0.35
Obs./R^2	778	0.16	778	0.13	769	0.21	769	0.18	1,292	0.18	1,292	0.16
B-P REtest	-	-	444	0.00	-	-	396	0.00	-	-	1,168	0.00
FUEL INTENSITIES, BASIC METALS (MSIC 27)												
LE_{it}	0.6740	0.00	0.1271	0.34	0.5970	0.00	0.4076	0.00	0.6480	0.00	0.4074	0.01
LK_{it}	0.0449	0.57	0.1025	0.28	0.0937	0.00	0.0806	0.01	0.0708	0.24	0.0626	0.34
LM_{it}	-0.0594	0.32	0.0772	0.34	-0.1471	0.01	-0.1923	0.01	-0.1073	0.02	-0.1402	0.03
ES_{it}	-0.0064	0.40	-0.0150	0.05	-0.0072	0.16	-0.0086	0.04	-0.0068	0.16	-0.0115	0.02
RD_{it}	-0.0605	0.10	-0.0155	0.44	-0.0245	0.03	-0.0228	0.01	-0.0198	0.08	-0.0048	0.57
DF_{it}	-0.3696	0.00	0.0855	0.61	-0.2164	0.10	0.0100	0.94	-0.3140	0.00	-0.0246	0.83
Obs./R^2	778	0.23	778	0.15	769	0.20	769	0.17	1,292	0.21	1,292	0.18
B-P REtest	-	-	443	0.00	-	-	419	0.00	-	-	1,028	0.00
WATER INTENSITIES, BASIC METALS (MSIC 27)												
LE_{it}	0.0134	0.54	-0.0321	0.27	0.0871	0.00	0.0679	0.00	0.0389	0.01	-0.0051	0.83
LK_{it}	0.0219	0.00	0.0193	0.02	0.0221	0.01	0.0146	0.07	0.0245	0.00	0.0153	0.01
LM_{it}	-0.0697	0.00	-0.0401	0.03	-0.0819	0.00	-0.0671	0.00	-0.0738	0.00	-0.0387	0.00
ES_{it}	0.0001	0.92	0.0007	0.45	0.0009	0.37	0.0007	0.67	0.0006	0.48	0.0008	0.55
RD_{it}	-0.0135	0.00	-0.0012	0.30	-0.0058	0.00	-0.0047	0.01	-0.0065	0.00	-0.0033	0.13
DF_{it}	-0.0345	0.32	-0.0431	0.26	0.0085	0.77	0.0146	0.69	-0.0282	0.26	-0.0709	0.05
Obs./R^2	778	0.08	778	0.06	769	0.11	769	0.10	1,292	0.08	1,292	0.06
B-P REtest	-	-	147	0.00	-	-	250	0.00	-	-	296	0.00

Appendix Table 5 (continued)

Indepen-dent variable, statistic	2000-2002				2002-2004				2000-2004			
	Pooled		Rand. Effects		Pooled		Rand. Effects		Pooled		Rand. Effects	
	Value	P-val.	Value	P-val.	Value	P-val.	Value	P-val.	Value	P-val.	Value	P-val.
TOTAL ENERGY INTENSITIES, METAL PRODUCTS (MSIC 28)												
LE_{it}	0.3628	0.00	0.2178	0.04	0.6581	0.00	0.5867	0.00	0.4887	0.00	0.3384	0.00
LK_{it}	0.3265	0.00	0.2622	0.00	0.2424	0.00	0.1478	0.00	0.2737	0.00	0.1847	0.00
LM_{it}	0.6934	0.00	-0.5300	0.00	-0.7725	0.00	-0.6792	0.00	-0.7121	0.00	-0.5287	0.00
ES_{it}	0.0023	0.60	0.0033	0.48	-0.0035	0.43	0.0054	0.19	0.0017	0.62	0.0046	0.21
RD_{it}	-0.1181	0.00	-0.0026	0.98	-0.1191	0.02	-0.0211	0.54	-0.1198	0.00	-0.0036	0.93
DF_{it}	0.8984	0.00	0.4498	0.08	1.2226	0.00	0.7088	0.00	0.9980	0.00	0.3119	0.10
Obs./R^2	1,805	0.12	1,805	0.11	1,877	0.16	1,877	0.15	3,062	0.13	3,062	0.12
B-P REtest	-	-	754	0.00	-	-	1,020	0.00	-	-	2,469	0.00
ELECTRICITY INTENSITIES, METAL PRODUCTS (MSIC 28)												
LE_{it}	0.2269	0.00	0.0964	0.34	0.5125	0.00	0.4397	0.00	0.3475	0.00	0.2255	0.00
LK_{it}	0.2139	0.00	0.1675	0.02	0.1691	0.00	0.0921	0.00	0.1874	0.00	0.1220	0.00
LM_{it}	-0.4618	0.00	-0.2424	0.00	-0.5624	0.00	-0.4407	0.00	-0.5008	0.00	-0.2842	0.00
ES_{it}	0.0089	0.02	0.0019	0.66	0.0028	0.42	0.0060	0.06	0.0072	0.01	0.0038	0.24
RD_{it}	-0.0875	0.00	-0.0043	0.96	-0.0429	0.27	0.0073	0.81	-0.0694	0.01	-0.0035	0.90
DF_{it}	0.5488	0.00	0.0312	0.88	0.8424	0.00	0.5239	0.00	0.6437	0.00	0.0947	0.54
Obs./R^2	1,805	0.13	1,805	0.10	1,877	0.16	1,877	0.16	3,062	0.14	3,062	0.12
B-P REtest	-	-	638	0.00	-	-	1,094	0.00	-	-	2,263	0.00
FUEL INTENSITIES, METAL PRODUCTS (MSIC 28)												
LE_{it}	0.1344	0.01	0.1095	0.04	0.1449	0.01	0.1377	0.01	0.1400	0.00	0.1060	0.01
LK_{it}	0.1132	0.00	0.0964	0.00	0.0739	0.00	0.0532	0.00	0.0868	0.00	0.0627	0.00
LM_{it}	-0.2314	0.00	-0.2366	0.00	0.2111	0.00	-0.2329	0.00	-0.2117	0.00	-0.2211	0.00
ES_{it}	-0.0067	0.00	-0.0031	0.14	-0.0065	0.01	-0.0005	0.82	-0.0056	0.00	-0.0006	0.69
RD_{it}	-0.0316	0.23	0.0111	0.84	0.0775	0.00	-0.0276	0.02	-0.0515	0.00	0.0012	0.95
DF_{it}	0.3542	0.00	0.3357	0.00	0.3877	0.00	0.1651	0.16	0.3600	0.00	0.2033	0.02
Obs./R^2	1,805	0.07	1,805	0.06	1,877	0.08	1,877	0.07	3,062	0.07	3,062	0.05
B-P REtest	-	-	683	0.00	-	-	867	0.00	-	-	2,274	0.00
WATER INTENSITIES, METAL PRODUCTS (MSIC 28)												
LE_{it}	0.0197	0.21	-0.0409	0.17	0.0660	0.00	0.0572	0.00	0.0367	0.00	-0.0158	0.35
LK_{it}	0.0231	0.00	0.0379	0.09	0.0190	0.00	0.0146	0.00	0.0187	0.00	0.0222	0.02
LM_{it}	-0.0851	0.00	-0.0486	0.02	-0.1023	0.00	-0.0854	0.00	-0.0857	0.00	-0.0381	0.00
ES_{it}	0.0026	0.00	0.0010	0.40	0.0012	0.05	0.0003	0.67	0.0021	0.00	0.0009	0.20
RD_{it}	-0.0177	0.00	-0.0285	0.10	-0.0066	0.51	-0.0005	0.95	-0.0119	0.03	-0.0084	0.11
DF_{it}	-0.0033	0.91	-0.0452	0.37	0.0993	0.00	0.0535	0.14	0.0335	0.12	-0.0555	0.10
Obs./R^2	1,805	0.09	1,805	0.06	1,877	0.15	1,877	0.14	3,062	0.11	3,062	0.07
B-P REtest	-	-	148	0.00	-	-	744	0.00	-	-	845	0.00

Appendix Table 5 (continued)

Independent variable, statistic	2000-2002				2002-2004				2000-2004			
	Pooled		Rand. Effects		Pooled		Rand. Effects		Pooled		Rand. Effects	
	Value	P-val.	Value	P-val.	Value	P-val.	Value	P-val.	Value	P-val.	Value	P-val.
TOTAL ENERGY INTENSITIES, ELECTRONICS-RELATED MACHINERY (MSIC 30-33)												
LE_{it}	0.3849	0.00	0.3404	0.00	0.5270	0.00	0.5396	0.00	0.4322	0.00	0.4091	0.00
LK_{it}	0.5607	0.00	0.5481	0.00	0.3578	0.00	0.3078	0.00	0.4089	0.00	0.3150	0.00
LM_{it}	-1.0832	0.00	-1.1241	0.00	-1.0021	0.00	-0.9765	0.00	-0.9746	0.00	-0.9415	0.00
ES_{it}	0.0152	0.03	0.0137	0.02	0.0167	0.02	0.0143	0.12	0.0132	0.01	0.0134	0.05
RD_{it}	0.1174	0.25	0.0960	0.10	0.1649	0.00	0.1744	0.01	0.1253	0.00	0.1423	0.04
DF_{it}	-0.0113	0.94	0.0407	0.81	0.3322	0.03	0.2782	0.13	0.0742	0.49	-0.0599	0.64
Obs./R^2	2,052	0.24	2,052	0.23	1,891	0.25	1,891	0.25	3,286	0.25	3,286	0.24
B-P REtest	-	-	226	0.00	-	-	363	0.00	-	-	946	0.00
ELECTRICITY INTENSITIES, ELECTRONICS-RELATED MACHINERY (MSIC 30-33)												
LE_{it}	0.3507	0.00	0.2948	0.02	0.4541	0.00	0.4676	0.00	0.3811	0.00	0.3519	0.00
LK_{it}	0.5100	0.00	0.4793	0.00	0.3103	0.00	0.2759	0.00	0.3642	0.00	0.2926	0.00
LM_{it}	-0.9885	0.00	-1.0048	0.00	-0.8838	0.00	-0.8626	0.00	-0.8688	0.00	-0.8344	0.00
ES_{it}	0.0179	0.01	0.0134	0.01	0.0189	0.01	0.0167	0.05	0.0157	0.00	0.0149	0.03
RD_{it}	0.1188	0.25	0.0638	0.09	0.1028	0.07	0.1108	0.11	0.0757	0.11	0.0909	0.19
DF_{it}	0.0511	0.72	-0.0423	0.78	0.3945	0.01	0.3427	0.05	0.1298	0.20	-0.0784	0.50
Obs./R^2	2,052	0.23	2,052	0.21	1,891	0.22	1,891	0.23	3,286	0.23	3,286	0.22
B-P REtest	-	-	174	0.00	-	-	269	0.00	-	-	693	0.00
FUEL INTENSITIES, ELECTRONICS-RELATED MACHINERY (MSIC 30-33)												
LE_{it}	0.0352	0.14	0.0375	0.07	0.0711	0.08	0.0678	0.12	0.0500	0.03	0.0565	0.02
LK_{it}	0.0518	0.00	0.0458	0.00	0.0482	0.00	0.0304	0.01	0.0454	0.00	0.0223	0.08
LM_{it}	-0.0972	0.00	-0.1034	0.00	-0.1177	0.00	-0.1186	0.00	-0.1061	0.00	-0.1084	0.00
ES_{it}	-0.0027	0.01	-0.0018	0.06	-0.0022	0.13	-0.0010	0.46	-0.0026	0.01	-0.0016	0.03
RD_{it}	-0.0010	0.95	0.0120	0.59	0.0643	0.07	0.0462	0.13	0.0512	0.11	0.0530	0.09
DF_{it}	-0.0643	0.02	0.0231	0.58	-0.0635	0.09	-0.0458	0.30	-0.0570	0.02	0.0197	0.67
Obs./R^2	2,052	0.11	2,052	0.11	1,891	0.13	1,891	0.12	3,286	0.12	3,286	0.11
B-P REtest	-	-	652	0.00	-	-	963	0.00	-	-	2,234	0.00
WATER INTENSITIES, ELECTRONICS-RELATED MACHINERY (MSIC 30-33)												
LE_{it}	0.0152	0.33	0.0045	0.85	0.0265	0.01	0.0219	0.11	0.0170	0.11	0.0188	0.24
LK_{it}	0.0377	0.00	0.0366	0.00	0.0246	0.00	0.0162	0.00	0.0300	0.00	0.0185	0.00
LM_{it}	-0.0767	0.00	-0.0747	0.00	-0.0684	0.00	-0.0636	0.00	-0.0692	0.00	-0.0694	0.00
ES_{it}	0.0022	0.00	0.0020	0.03	0.0014	0.02	0.0017	0.07	0.0015	0.00	0.0021	0.02
RD_{it}	0.0012	0.85	0.0027	0.42	0.0145	0.08	0.0101	0.17	0.0089	0.15	0.0081	0.23
DF_{it}	-0.1198	0.00	-0.1219	0.00	-0.0242	0.12	-0.0125	0.46	-0.0863	0.00	-0.0927	0.00
Obs./R^2	2,052	0.11	2,052	0.09	1,891	0.15	1,891	0.14	3,286	0.11	3,286	0.07
B-P REtest	-	-	81.06	0.00	-	-	370	0.00	-	-	297	0.00

Notes: Industry-level estimates are not performed for petroleum products because of small sample size; all p-values based on robust standard errors [clustered by plant for random effects]); estimated equations also include year, state, and industry dummies as relevant (see explanation in the text; detailed estimates including all dummies and the constant available from authors).