

Network industries in Eurasia



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Network industries in Eurasia

Welcome to the Spring 2015 issue of Network Industries Quarterly! For the first time in its history an issue of Network Industries Quarterly is exclusively dedicated to the evolution of network industries outside of Europe, in this case in Eurasia.

The first article (Akkemik and Li) focusses on recent regulatory reforms in the energy market in China, assessing the potential impacts of changes in energy prices in China on producer prices in various sectors. The second article (Cetinkaya, Basaran and Bagdadioglu) discusses the main obstacles to the liberalization of the Turkish electricity sector. The third article (Eroglu) focuses on the role of the regulatory authorities in Turkey's liberalized electricity market. And the fourth article (Oguz and Benli) discusses fixed-mobile substitution in the context of Turkey's telecommunications liberalization process.

All four contributions go back to an inaugural Conference on network industries in Eurasia, held at the Social Sciences University in Ankara in November 2014 and which will be held annually from now on. Similar conferences will be organized by network-industries.org in other parts of the world, notably in Africa and Latin America in 2016 and beyond.

We hope that you find these contributions interesting and support Network Industries Quarterly's reaching out to emerging countries in the future.

Matthias Finger

Network Industries Quarterly | Published four times a year, contains information about postal, telecommunications, energy, water, transportation and network industries in general. It provides original analysis, information and opinions on current issues. The editor establishes caps, headings, sub-headings, introductory abstract and inserts in articles. He also edits the articles. Opinions are the sole responsibility of the author(s).

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The Impact of Energy Price Deregulation on Sectoral Producer Prices in China

K. Ali Akkemik*, Jia Li**

Abstract: The present paper examines the effects that changes in energy prices following deregulation in prices are likely to have on sectoral producer prices. Specifically, energy prices are expected to increase in China.

1. Introduction

Rapid growth and urbanization in China have resulted in increased demand for energy. In recent years, the industrial structure has shifted towards more energy-consuming heavy industries, which has further increased energy demand. To tackle the challenges posed by such problems, the Chinese Government has recently introduced various reforms to enhance energy efficiency and promote energy-saving technologies. The government has also implemented deregulatory reforms to bring energy prices closer to market-clearing levels. Inefficiencies in the energy sectors due to price distortions including subsidies have been well-reported (Hang and Tu, 2007).

The present paper examines the effects that changes in energy prices following deregulation in prices are likely to have on sectoral producer prices. Specifically, energy prices are expected to increase in China. Since energy is an important input to varying degrees across economic activities, changing energy prices will have a direct impact on the price level of the activity. On the other hand, indirect price effects work through inter-sectoral linkages across sectors. To quantify such effects, we employ the social accounting matrix (SAM) price modeling technique and SAMs for China for the years 2002 and 2007.

2. Energy Price Deregulation in China

Since the opening of the Chinese economy from 1978 onwards, the Chinese energy sector has experienced significant reforms. Before the reforms, the strategy for energy production, distribution, and investments was defined in five-year plans, while the operation was directed by annual plans. All energy prices were determined by the central government and often maintained at very low levels. After 1978, large-scale institutional reforms in the energy sector were undertaken by the Chinese central government. To date, energy reforms have mainly targeted electricity and coal markets, the most important energy sources in China.

In the case of oil and natural gas markets, the central government's regulations were very strict, since natural gas and oil are largely imported.

Energy pricing has always been an important part of the energy sector reforms in China. Following the opening up of the economy, a dual-track pricing system was introduced in the 1980s whereby the central plan set the prices for the plan segment of the energy sector and these prices were gradually replaced by the market prices for the market segment of the energy sector (Wu 2003, Hang and Tu 2007). By the early 1990s, energy prices had largely been liberalized, but price controls were reintroduced in 1994 due to high inflation in 1993 (Hang and Tu, 2007). Following the acceleration of energy price reforms after 1996, plan allocation of energy was largely abolished in the late 1990s and this affected energy prices (Hang and Tu, 2007).

In the oil sector, where China is largely dependent on imports, domestic oil prices are subsidized. The dual-track pricing system was abandoned in the oil sector after 1994 and the central government started to strictly control oil prices (Wu 2003, Hang and Tu 2007). After 1998, however, domestic oil prices have been set with reference to the changes in world prices (Zhao et al., 2009).

Coal is by far the most liberalized energy sector in China. Coal is the most important input for electricity generation and the price of coal used in electricity generation facilities has therefore been under strict government control. Substantial liberalization was introduced in the coal sector after 1993, but the price of coal used in electricity was closely regulated. Coal prices were largely liberalized after 2002.

Deregulation in the electricity sector is still under way and progress has been slow due to power shortages. Although regulation of the electricity market is tighter than other energy sectors, electricity tariffs reflect the changes in generation costs (particularly coal prices) more closely than before. The regulation history of the electricity

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market is complicated due to the political power possessed by electricity facilities. Prior to 1985, electricity supply was determined according to central planning and plan quotas were allocated to the generation facilities across the country. Due to power shortages, the government started rate-of-return regulation in the electricity market after 1985 and took measures to attract private entrepreneurs. Independent power producers entered the electricity market in the 1990s and public electricity generation and distribution sectors were decentralized (Cherni and Kentish, 2007). Transmission, distribution, and end-user tariffs have been set by the government (Zhao et al., 2009).

In the natural gas sector, supply shortages and large imports have meant that this industry has been under tight government regulation. Despite the reduction in subsidies, domestic natural gas prices have been subject to tight government regulation and have been set below global prices (Wu, 2003). The transmission price and the reference production price are decided by the government, and the retail prices are decided by local governments (Zhao et al., 2009).

Overall, the prices of oil and coal have become increasingly market-oriented, whereas electricity and natural prices are tightly regulated, albeit dictated by market forces to some extent. The end result of the various degrees of deregulation and price reforms across energy markets is an increase in energy prices, as has been experienced in many other countries. In addition, the imbalance in the degree of price deregulations has inevitably caused disputes between different energy sectors. For example, although retail electricity prices remain under government control, coal prices have been liberalized (Zhao et al., 2009). As a result, regulated electricity prices do not necessarily reflect the increases in coal prices (Zhou et al., 2010). Since 2006, the government has provided large subsidies to energy suppliers in order to address the mismatches between regulated electricity and oil product prices and the costs of the material inputs for producing these energy sources (Zhou et al., 2010).

3. SAM Price Modeling

In the present study we have used the SAM price modeling technique (Roland-Holst and Sancho 1995, Parra and Wodon 2008, Akkemik 2011). The SAM price model is the dual of the quantity-based SAM model. In this method, quantities are fixed and prices are allowed to change.

We first transform the input-output table figures, which

are expressed in monetary terms, to physical units. We then rewrite the conventional input-output model expressed in monetary values in terms of the dual of the quantity model to express the change in the price level of an activity as the product of a shock and the price multiplier, which extends the initial impact of the exogenous shock to the input-output relations across activities. Finally, we decompose the SAM price multiplier into direct price effects and three indirect effects; namely, transfer, open-loop, and closed-loop effects. Direct price effect measures the effect of a change in the price level of an activity on the production block itself (activity and commodity accounts combined).

Transfer effects account for the changes arising from an exogenous shock within a group of accounts (such as activities block, commodities block, and institutions block). In the institutions block, the enterprises, the government, and the rest of the world's accounts are all set as exogenous and only the households account is endogenous. Transfer effects are not allowed within the factors block (capital and labor). If the price level of an energy activity account changes, transfer effects measure how the changing energy cost is multiplied through cost relationships across the production activities.

Open-loop effects measure the effects of an exogenous shock across different SAM blocks. The open-loop effect resulting from a change in the price level of an energy account reflects the interactions of costs across production sectors due to the intersectoral cost structure of the economy.

Finally, closed-loop effects measure the magnifying effect of an exogenous shock on endogenous accounts after the circular travel is completed. Circular travel refers to the shock's movement from the production block (activities and commodities) to the households account, then to the factors block (capital and labor) and then back to the production block. In the case of a change in energy prices, the closed-loop effect demonstrates the effect that the change has on the price levels of the production sectors after affecting households' price level (cost of living), which then affects their factor incomes (revenues from the rendering of capital and labor services), and then back to the costs of production sectors. The closed-loop effect reflects the circular flow diagram.

The data for the SAM pricing model are organized into two SAMs for the years 2002 and 2007. The SAMs have 35 sectors. The input-output tables used in the construction of the SAMs for 2002 and 2007 were obtained from the National Bureau of Statistics.

We have conducted some simulations regarding the

possible changes in energy prices in the near future as a result of the ongoing developments in the energy demand-supply conditions and the undergoing deregulations in the energy markets. We assumed that energy prices are subject to increase in the near future due to energy supply shortages and the government's intentions to remove subsidies. In the simulations we allowed energy prices to increase by 10 percent.

Price multipliers are presented in Table 1. The multipliers represent the impact of 10 percent increases in the energy prices on the price levels of 35 economic activities. Energy price shocks have the highest impacts on themselves. We also compare the results for 2002 and 2007 and see that this finding holds for both years. The largest impact on other sectors' price levels is observed in the price shock given to electricity. Coal price shock had a considerable effect on electricity prices in both 2002 and 2007. Natural gas prices had the weakest impact on other sectors' producer prices. In 2002, increasing electricity prices by 10 percent increased the price level of 10 economic sectors by more than 1 percent. In 2007, such an increase affected 27 sectors in this way. This shows that electricity prices are important for sectoral producer prices in China.

The price multipliers are further decomposed into transfer effect and closed-loop effect, as described in section 3.2.1. The results of the price multiplier decomposition are presented in Table 2 for 2002 and in Table 3 for 2007. Open-loop effects are not reported for production accounts because the origin and destination fall into the same block, which means that the open-loop effects are equal to zero.

Since we are not interested in income distribution, we do not report in detail the results for the institutions accounts (households and enterprises). For these accounts, transfer and closed-loop effects are null since the account of origin and destination are in different blocks, and only open-loop effects count. The impact of the price shocks on the households account reflects the effect on households' cost of living, which is negligible: between 0.001 (gas, 2007) and 0.032 (electricity, 2002) percentage points. However, among the impact of energy prices on the cost of living, electricity prices clearly have the highest impact.

Transfer effects account for the largest portion of price multipliers. A strong transfer effect indicates strong intersectoral interaction and hence a high level of integration between the shock-giving sector and the destination sector. From 2002 to 2007, transfer effects of energy price rises increased for virtually all sectors, but most notably for gas prices. Transfer effects of coal and electricity price

shocks increased between 10 and 20 percentage points for most sectors from 2002 to 2007. The increase was much smaller for oil price shock, mostly below 10 percent. The transfer effects of the gas price shock were relatively low compared to the transfer effects of coal, oil, and electricity prices in 2002; however, despite the large increases in 2007, they remained lower for almost all sectors, which indicates that gas has a smaller degree of importance as an energy source for the production sectors.

Closed-loop effects account for the remaining portion of the price multipliers after the transfer accounts are counted. Closed-loop effects are relatively small and amount to about one third of the price multipliers for the coal, oil, and electricity price shocks. This reflects the degree of forward linkages by these energy sectors. On the other hand, closed-loop effects of gas price shocks dominate the price multipliers, exceeding 50 percent of price multipliers in 27 of the 35 sectors in 2002. However, the closed loop effects in all energy sectors declined from 2002 to 2007 in virtually all sectors. Altogether, there are only 14 instances of increasing closed-loop effects by energy price shocks from 2002 to 2007 (out of a total of 136 cases). Closed-loop effects by coal and electricity dominate significantly only in agriculture. In addition, in both years (2002 and 2007), the services sectors and food manufacturing (food, beverages, and tobacco) generally exhibit large closed-loop effects in response to energy shocks compared to other production sectors. This finding reflects the strong forward linkages by these sectors with the rest of the economy. Closed-loop effects are relatively small in the other sectors, implying a relatively low level of linkage effects.

The abovementioned results indicate that the production sectors became increasingly dependent on electricity from 2002 to 2007 and much of the price influence arising from energy price shocks worked through transfer effects, with the closed-loop effects being less significant. Furthermore, the transfer effects increased for virtually all sectors from 2002 to 2007, to the detriment of closed-loop effects. In other words, the energy price shocks are dictated mainly through intersectoral input relations and less through the circular flow. In addition, this has been strengthened from 2002 and 2007.

4. Conclusion

The results of our analyses have some policy implications for China. The changes in producer prices are transmitted to consumer prices and therefore affect the overall price level. The results presented in this paper quantitatively

demonstrate that changes in electricity prices have the greatest effect on producer prices, and the price of coal has a direct effect on the price of the generated electricity. Any policy measure or shift regarding energy prices should also take such effects on the prices of other sectors into consideration.

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| Sector | 2002 | | | | 2007 | | | |
|------------------------|-------------------------------|------|-------------|------|-------------------------------|------|-------------|------|
| | 10 % increase in the price of | | | | 10 % increase in the price of | | | |
| | Coal | Oil | Electricity | Gas | Coal | Oil | Electricity | Gas |
| Agriculture | 0.3 | 0.3 | 0.8 | 0.0 | 0.3 | 0.3 | 1.3 | 0.1 |
| Coal | 10.6 | 0.3 | 1.3 | 0.0 | 11.5 | 0.3 | 2.0 | 0.0 |
| Oil | 0.3 | 10.3 | 0.8 | 0.0 | 0.4 | 10.4 | 1.8 | 0.0 |
| Metal-mining | 0.5 | 0.5 | 1.7 | 0.0 | 0.6 | 0.6 | 3.1 | 0.1 |
| Nonmetal-mining | 0.4 | 0.4 | 1.1 | 0.0 | 0.5 | 0.6 | 2.0 | 0.1 |
| Food | 0.3 | 0.2 | 0.7 | 0.0 | 0.3 | 0.3 | 1.2 | 0.0 |
| Textile | 0.4 | 0.2 | 0.9 | 0.0 | 0.4 | 0.4 | 1.6 | 0.0 |
| Clothing | 0.3 | 0.2 | 0.7 | 0.0 | 0.3 | 0.3 | 1.2 | 0.0 |
| Wood-furniture | 0.4 | 0.3 | 0.9 | 0.0 | 0.4 | 0.4 | 1.5 | 0.0 |
| Paper-printing | 0.3 | 0.2 | 0.8 | 0.0 | 0.4 | 0.3 | 1.4 | 0.0 |
| Oil refining | 0.6 | 4.6 | 0.8 | 0.0 | 0.9 | 4.0 | 1.4 | 0.0 |
| Chemicals | 0.5 | 0.5 | 1.2 | 0.0 | 0.6 | 0.8 | 2.0 | 0.1 |
| Nonmetal minerals | 0.8 | 0.4 | 1.3 | 0.0 | 1.1 | 0.5 | 2.2 | 0.1 |
| Smelting | 0.7 | 0.4 | 1.4 | 0.0 | 0.7 | 0.5 | 2.1 | 0.1 |
| Iron-steel | 0.5 | 0.3 | 1.3 | 0.0 | 0.5 | 0.4 | 2.1 | 0.0 |
| Machinery | 0.4 | 0.3 | 1.0 | 0.0 | 0.4 | 0.4 | 1.6 | 0.0 |
| Transport equipment | 0.3 | 0.3 | 0.8 | 0.0 | 0.4 | 0.3 | 1.3 | 0.0 |
| Electrical machines | 0.4 | 0.3 | 0.9 | 0.0 | 0.4 | 0.4 | 1.4 | 0.0 |
| Telecom equipment | 0.2 | 0.2 | 0.6 | 0.0 | 0.2 | 0.2 | 0.9 | 0.0 |
| Precision equipment | 0.3 | 0.2 | 0.7 | 0.0 | 0.3 | 0.3 | 1.0 | 0.0 |
| Other manufacturing | 0.4 | 0.3 | 0.9 | 0.0 | 0.4 | 0.4 | 1.5 | 0.1 |
| Scrap-waste | 0.0 | 0.0 | 0.1 | 0.0 | 0.1 | 0.1 | 0.3 | 0.0 |
| Electricity | 1.9 | 0.4 | 10.9 | 0.0 | 2.0 | 0.5 | 16.5 | 0.0 |
| Gas supply | 2.9 | 1.0 | 1.3 | 10.5 | 1.0 | 3.6 | 1.3 | 10.5 |
| Water supply | 0.6 | 0.2 | 2.5 | 0.1 | 0.6 | 0.3 | 4.0 | 0.1 |
| Construction | 0.4 | 0.4 | 0.9 | 0.0 | 0.5 | 0.5 | 1.6 | 0.0 |
| Transport services | 0.3 | 0.7 | 0.7 | 0.0 | 0.3 | 0.9 | 0.9 | 0.0 |
| Postal services | 0.3 | 0.3 | 0.9 | 0.0 | 0.3 | 0.4 | 1.2 | 0.0 |
| Telecom services | 0.2 | 0.1 | 0.6 | 0.0 | 0.2 | 0.2 | 0.9 | 0.0 |
| Wholesale-retail trade | 0.2 | 0.2 | 0.6 | 0.0 | 0.2 | 0.2 | 0.8 | 0.0 |
| Hotels-restaurants | 0.3 | 0.2 | 0.7 | 0.1 | 0.3 | 0.3 | 1.2 | 0.1 |
| Financial services | 0.2 | 0.1 | 0.5 | 0.0 | 0.1 | 0.2 | 0.6 | 0.0 |
| Real estate | 0.2 | 0.1 | 0.4 | 0.0 | 0.1 | 0.1 | 0.4 | 0.0 |
| Business services | 0.2 | 0.2 | 0.6 | 0.0 | 0.3 | 0.4 | 1.0 | 0.0 |
| Other services | 0.4 | 0.2 | 0.8 | 0.0 | 0.3 | 0.3 | 1.3 | 0.0 |

Table 1. Price shocks: Percentage change in activity prices

| | 1% rise in coal price | | | 1% rise in oil price | | | 1% rise in electricity price | | | 1% rise in gas price | | |
|------------------------|-----------------------|-------|-------|----------------------|-------|-------|------------------------------|-------|-------|----------------------|-------|-------|
| | PM | TE | CLE | PM | TE | CLE | PM | TE | CLE | PM | TE | CLE |
| Agriculture | 0.033 | 0.013 | 0.020 | 0.026 | 0.012 | 0.013 | 0.077 | 0.029 | 0.048 | 0.004 | 0.000 | 0.003 |
| Coal | 0.063 | 0.047 | 0.016 | 0.026 | 0.016 | 0.010 | 0.130 | 0.092 | 0.038 | 0.003 | 0.001 | 0.003 |
| Oil | 0.028 | 0.020 | 0.008 | 0.027 | 0.022 | 0.005 | 0.081 | 0.062 | 0.019 | 0.003 | 0.001 | 0.001 |
| Metal-mining | 0.049 | 0.037 | 0.012 | 0.052 | 0.044 | 0.008 | 0.171 | 0.143 | 0.028 | 0.004 | 0.002 | 0.002 |
| Nonmetal-mining | 0.037 | 0.024 | 0.013 | 0.039 | 0.030 | 0.009 | 0.111 | 0.079 | 0.032 | 0.004 | 0.001 | 0.002 |
| Food | 0.029 | 0.016 | 0.013 | 0.021 | 0.012 | 0.009 | 0.068 | 0.035 | 0.032 | 0.003 | 0.001 | 0.002 |
| Textile | 0.035 | 0.023 | 0.013 | 0.024 | 0.016 | 0.009 | 0.090 | 0.059 | 0.031 | 0.003 | 0.001 | 0.002 |
| Clothing | 0.028 | 0.016 | 0.012 | 0.022 | 0.014 | 0.008 | 0.071 | 0.041 | 0.029 | 0.003 | 0.001 | 0.002 |
| Wood-furniture | 0.040 | 0.028 | 0.013 | 0.028 | 0.020 | 0.009 | 0.092 | 0.062 | 0.030 | 0.003 | 0.001 | 0.002 |
| Paper-printing | 0.034 | 0.023 | 0.011 | 0.024 | 0.017 | 0.008 | 0.083 | 0.055 | 0.027 | 0.003 | 0.001 | 0.002 |
| Oil refining | 0.058 | 0.050 | 0.008 | 0.458 | 0.453 | 0.005 | 0.081 | 0.062 | 0.019 | 0.003 | 0.002 | 0.001 |
| Chemicals | 0.051 | 0.041 | 0.010 | 0.054 | 0.048 | 0.007 | 0.118 | 0.094 | 0.025 | 0.003 | 0.001 | 0.002 |
| Nonmetal minerals | 0.081 | 0.068 | 0.012 | 0.039 | 0.031 | 0.008 | 0.132 | 0.102 | 0.030 | 0.004 | 0.002 | 0.002 |
| Smelting | 0.068 | 0.057 | 0.011 | 0.045 | 0.038 | 0.007 | 0.136 | 0.111 | 0.025 | 0.004 | 0.002 | 0.002 |
| Iron-steel | 0.047 | 0.036 | 0.011 | 0.034 | 0.027 | 0.007 | 0.126 | 0.100 | 0.026 | 0.003 | 0.001 | 0.002 |
| Machinery | 0.040 | 0.029 | 0.011 | 0.028 | 0.021 | 0.007 | 0.095 | 0.069 | 0.026 | 0.003 | 0.001 | 0.002 |
| Transport equipment | 0.035 | 0.025 | 0.010 | 0.025 | 0.018 | 0.007 | 0.081 | 0.056 | 0.025 | 0.003 | 0.002 | 0.002 |
| Electrical machines | 0.037 | 0.027 | 0.010 | 0.029 | 0.022 | 0.007 | 0.088 | 0.064 | 0.024 | 0.004 | 0.002 | 0.002 |
| Telecom equipment | 0.022 | 0.015 | 0.008 | 0.017 | 0.012 | 0.005 | 0.057 | 0.039 | 0.018 | 0.002 | 0.001 | 0.001 |
| Precision equipment | 0.028 | 0.018 | 0.010 | 0.023 | 0.016 | 0.007 | 0.070 | 0.046 | 0.024 | 0.003 | 0.001 | 0.002 |
| Other manufacturing | 0.043 | 0.030 | 0.013 | 0.029 | 0.020 | 0.009 | 0.089 | 0.057 | 0.031 | 0.004 | 0.002 | 0.002 |
| Scrap-waste | 0.002 | 0.000 | 0.002 | 0.002 | 0.000 | 0.002 | 0.006 | 0.000 | 0.006 | 0.000 | 0.000 | 0.000 |
| Electricity | 0.192 | 0.183 | 0.010 | 0.039 | 0.033 | 0.006 | 0.087 | 0.063 | 0.023 | 0.003 | 0.001 | 0.002 |
| Gas supply | 0.294 | 0.282 | 0.012 | 0.102 | 0.094 | 0.008 | 0.130 | 0.101 | 0.029 | 0.050 | 0.048 | 0.002 |
| Water supply | 0.056 | 0.044 | 0.012 | 0.022 | 0.013 | 0.008 | 0.246 | 0.217 | 0.029 | 0.006 | 0.004 | 0.002 |
| Construction | 0.040 | 0.027 | 0.013 | 0.037 | 0.029 | 0.009 | 0.093 | 0.063 | 0.031 | 0.003 | 0.001 | 0.002 |
| Transport services | 0.030 | 0.018 | 0.012 | 0.073 | 0.065 | 0.008 | 0.065 | 0.037 | 0.028 | 0.004 | 0.002 | 0.002 |
| Postal services | 0.033 | 0.018 | 0.015 | 0.029 | 0.019 | 0.010 | 0.087 | 0.050 | 0.037 | 0.005 | 0.002 | 0.003 |
| Telecom services | 0.020 | 0.012 | 0.008 | 0.012 | 0.007 | 0.006 | 0.060 | 0.040 | 0.020 | 0.002 | 0.001 | 0.001 |
| Wholesale-retail trade | 0.024 | 0.012 | 0.012 | 0.021 | 0.013 | 0.008 | 0.064 | 0.036 | 0.028 | 0.003 | 0.001 | 0.002 |
| Hotels-restaurants | 0.030 | 0.017 | 0.013 | 0.020 | 0.011 | 0.009 | 0.074 | 0.043 | 0.031 | 0.006 | 0.003 | 0.002 |
| Financial services | 0.017 | 0.007 | 0.010 | 0.014 | 0.007 | 0.007 | 0.047 | 0.023 | 0.025 | 0.002 | 0.001 | 0.002 |
| Real estate | 0.018 | 0.010 | 0.008 | 0.011 | 0.006 | 0.006 | 0.038 | 0.018 | 0.020 | 0.002 | 0.001 | 0.001 |
| Business services | 0.022 | 0.013 | 0.010 | 0.017 | 0.011 | 0.007 | 0.057 | 0.034 | 0.024 | 0.003 | 0.001 | 0.002 |
| Other services | 0.035 | 0.019 | 0.016 | 0.024 | 0.013 | 0.011 | 0.080 | 0.040 | 0.039 | 0.004 | 0.001 | 0.003 |

Note: PM: Price multiplier, TE: Transfer effect, CLE: Closed-loop effect $PM = TE + CLE$.

Table 2. Price multiplier decomposition for 2002

| | 1% rise in coal price | | | 1% rise in oil price | | | 1% rise in electricity price | | | 1% rise in gas price | | |
|------------------------|-----------------------|-------|-------|----------------------|-------|-------|------------------------------|-------|-------|----------------------|-------|-------|
| | PM | TE | CLE | PM | TE | CLE | PM | TE | CLE | PM | TE | CLE |
| Agriculture | 0.031 | 0.011 | 0.020 | 0.034 | 0.014 | 0.020 | 0.128 | 0.044 | 0.083 | 0.005 | 0.001 | 0.004 |
| Coal | 0.147 | 0.137 | 0.010 | 0.034 | 0.024 | 0.010 | 0.198 | 0.154 | 0.044 | 0.004 | 0.002 | 0.002 |
| Oil | 0.036 | 0.029 | 0.007 | 0.042 | 0.035 | 0.007 | 0.178 | 0.149 | 0.029 | 0.004 | 0.002 | 0.001 |
| Metal-mining | 0.058 | 0.050 | 0.008 | 0.061 | 0.053 | 0.008 | 0.311 | 0.277 | 0.034 | 0.009 | 0.007 | 0.002 |
| Nonmetal-mining | 0.045 | 0.037 | 0.009 | 0.057 | 0.048 | 0.009 | 0.203 | 0.166 | 0.037 | 0.009 | 0.008 | 0.002 |
| Food | 0.030 | 0.017 | 0.013 | 0.030 | 0.017 | 0.013 | 0.115 | 0.060 | 0.055 | 0.004 | 0.002 | 0.003 |
| Textile | 0.041 | 0.030 | 0.011 | 0.036 | 0.026 | 0.011 | 0.156 | 0.110 | 0.045 | 0.005 | 0.002 | 0.002 |
| Clothing | 0.035 | 0.024 | 0.011 | 0.034 | 0.023 | 0.011 | 0.124 | 0.079 | 0.045 | 0.004 | 0.002 | 0.002 |
| Wood-furniture | 0.042 | 0.032 | 0.010 | 0.035 | 0.025 | 0.010 | 0.152 | 0.108 | 0.044 | 0.004 | 0.002 | 0.002 |
| Paper-printing | 0.040 | 0.032 | 0.008 | 0.034 | 0.026 | 0.008 | 0.143 | 0.108 | 0.034 | 0.004 | 0.002 | 0.002 |
| Oil refining | 0.088 | 0.082 | 0.006 | 0.396 | 0.390 | 0.006 | 0.139 | 0.114 | 0.025 | 0.005 | 0.003 | 0.001 |
| Chemicals | 0.061 | 0.054 | 0.007 | 0.082 | 0.074 | 0.007 | 0.198 | 0.166 | 0.032 | 0.007 | 0.005 | 0.002 |
| Nonmetal minerals | 0.108 | 0.100 | 0.008 | 0.051 | 0.043 | 0.008 | 0.224 | 0.189 | 0.034 | 0.005 | 0.003 | 0.002 |
| Smelting | 0.070 | 0.064 | 0.006 | 0.052 | 0.046 | 0.006 | 0.207 | 0.181 | 0.026 | 0.005 | 0.004 | 0.001 |
| Iron-steel | 0.054 | 0.047 | 0.007 | 0.042 | 0.035 | 0.007 | 0.212 | 0.182 | 0.030 | 0.005 | 0.003 | 0.002 |
| Machinery | 0.044 | 0.037 | 0.007 | 0.036 | 0.029 | 0.007 | 0.156 | 0.125 | 0.030 | 0.004 | 0.003 | 0.002 |
| Transport equipment | 0.037 | 0.029 | 0.007 | 0.034 | 0.026 | 0.007 | 0.133 | 0.102 | 0.032 | 0.004 | 0.003 | 0.002 |
| Electrical machines | 0.042 | 0.036 | 0.006 | 0.038 | 0.031 | 0.006 | 0.145 | 0.118 | 0.027 | 0.004 | 0.003 | 0.001 |
| Telecom equipment | 0.023 | 0.018 | 0.005 | 0.023 | 0.017 | 0.005 | 0.091 | 0.069 | 0.022 | 0.003 | 0.002 | 0.001 |
| Precision equipment | 0.030 | 0.024 | 0.006 | 0.027 | 0.021 | 0.006 | 0.103 | 0.076 | 0.026 | 0.004 | 0.002 | 0.001 |
| Other manufacturing | 0.045 | 0.035 | 0.010 | 0.038 | 0.028 | 0.010 | 0.151 | 0.108 | 0.042 | 0.005 | 0.003 | 0.002 |
| Scrap-waste | 0.007 | 0.005 | 0.002 | 0.006 | 0.004 | 0.002 | 0.027 | 0.017 | 0.010 | 0.001 | 0.000 | 0.001 |
| Electricity | 0.202 | 0.194 | 0.007 | 0.053 | 0.046 | 0.007 | 0.648 | 0.616 | 0.032 | 0.004 | 0.003 | 0.002 |
| Gas supply | 0.099 | 0.092 | 0.007 | 0.357 | 0.351 | 0.007 | 0.130 | 0.101 | 0.029 | 0.049 | 0.048 | 0.001 |
| Water supply | 0.060 | 0.050 | 0.010 | 0.034 | 0.024 | 0.010 | 0.399 | 0.357 | 0.043 | 0.007 | 0.005 | 0.002 |
| Construction | 0.054 | 0.046 | 0.009 | 0.047 | 0.038 | 0.009 | 0.161 | 0.124 | 0.037 | 0.004 | 0.002 | 0.002 |
| Transport services | 0.034 | 0.026 | 0.007 | 0.089 | 0.081 | 0.007 | 0.094 | 0.063 | 0.032 | 0.004 | 0.002 | 0.002 |
| Postal services | 0.031 | 0.017 | 0.014 | 0.042 | 0.029 | 0.014 | 0.119 | 0.060 | 0.058 | 0.005 | 0.002 | 0.003 |
| Telecom services | 0.017 | 0.011 | 0.006 | 0.016 | 0.009 | 0.006 | 0.086 | 0.060 | 0.026 | 0.003 | 0.001 | 0.001 |
| Wholesale-retail trade | 0.018 | 0.011 | 0.007 | 0.022 | 0.015 | 0.007 | 0.081 | 0.049 | 0.031 | 0.003 | 0.001 | 0.002 |
| Hotels-restaurants | 0.027 | 0.016 | 0.011 | 0.027 | 0.017 | 0.011 | 0.122 | 0.077 | 0.045 | 0.006 | 0.004 | 0.002 |
| Financial services | 0.014 | 0.007 | 0.008 | 0.016 | 0.009 | 0.008 | 0.065 | 0.032 | 0.033 | 0.002 | 0.001 | 0.002 |
| Real estate | 0.010 | 0.005 | 0.005 | 0.012 | 0.007 | 0.005 | 0.039 | 0.019 | 0.020 | 0.001 | 0.000 | 0.001 |
| Business services | 0.027 | 0.019 | 0.008 | 0.036 | 0.028 | 0.008 | 0.101 | 0.067 | 0.034 | 0.004 | 0.002 | 0.002 |
| Other services | 0.033 | 0.020 | 0.013 | 0.035 | 0.022 | 0.013 | 0.127 | 0.072 | 0.055 | 0.005 | 0.002 | 0.003 |

Note: PM: Price multiplier, TE: Transfer effect, CLE: Closed-loop effect PM = TE + CLE

Table 3. Price multiplier decomposition for 2007

Barriers to competition in the Turkish electricity market

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Abstract: This paper argues that efforts to liberalize the Turkish electricity market may be interrupted and that successful results may be deferred due to several structural deficiencies already present in the market. Specifically, the high rates of illegal electricity usage, the burdensome tariff structure for the consumers, and the anticompetitive conducts of the newly privatised distribution companies that the effective entry of independent retail electricity companies to the market are the main problems that the Turkish authorities face.

1. Introduction

This paper argues that efforts to liberalize the Turkish electricity market may be interrupted and that successful results may be deferred due to several structural deficiencies already present in the market. Specifically, the high rates of illegal electricity usage, the burdensome tariff structure for the consumers, and the anticompetitive conducts of the newly privatised distribution companies that affect the entry of independent retail electricity companies to the market are the main problems that the Turkish authorities face.

It is largely accepted that policies that have helped Turkey move towards a free market economy since the 1980s have been moderately successful, despite certain irregularities and inconsistencies. As an inherent part of this transformation, liberalization of network industries has been carried out following the intellectual trends in the world and the experiences of the other first-mover countries. Nevertheless, experience shows that it is hardly possible to have the desired welfare gains from the liberalization efforts without establishing the underlying microeconomic reforms (that is, rules related to firm and consumer behavior). In this regard, it is necessary, but not sufficient, to enact the essential rules of the game and conform the proper sequencing of legislative and institutional reforms for electricity market liberalization. From the point of the Turkish practice, regulation and competition policies that incorporate a consistent and coherent enforcement of the current legislation are more crucial than ever in order to promptly deal with market-specific anomalies.

Within this concept, the present paper attempts to encapsulate the course of electricity sector reforms in Turkey

by referring to the abovementioned problems, especially the ones regarding the competition issues in the electricity distribution and retail level. We then offer some activist policy recommendations.

2. The Turkish Experience: Not unique!

The Turkish Electricity Authority (TEK) was established to carry out the electricity services as a vertically integrated public utility company in 1970. The liberalization activities and the economic transformation policies that started in the early 1980s have not excluded the Turkish electricity sector. In this context, and primarily by dint of Law no. 3096 of 1984, private companies are entitled to operate in the fields of electricity generation, distribution, and trade. The generation and distribution activities of TEK were separated by establishing two publicly owned companies, TEAŞ and TEDAŞ, which indicated the pathway of the reform process and the determination of the state on liberalization policy. Following the functional separation of TEK, private undertakings were motivated in the electricity sector, especially by Build-Operate (BO) and Build-Operate-Transfer (BOT) contracts. Take-or-pay clauses were a typical feature of the contracts signed during this period. However neither the BO nor the BOT model was adequate because of the weak competitive bidding process for the privileged rights, misleading pricing policy, and improperly drawn contracts (Atiyas, et al., 2012: 22). As a result, the ineffective enforcement of BO and BOT models led policy makers to seek alternative ways of liberalization. Thus, TEAŞ was divided in three functional companies for generation (EÜAŞ), transmission (TEİAŞ) and trade (TETAŞ), commencing in the 2000s.

Basically, the abovementioned government actions may

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be deemed as the preliminary attempts for the following liberalization activities. The experiences gained during the previous periods affected the subsequent stages of the reform process. On this basis, the Electricity Market Law (EML) of 2001 established the framework for a competitive market structure and establishment of a functioning liberalized electricity industry. Establishing the energy regulator, clarifying the privatization strategy and reform process (Strategy Document of 2004), and setting out the policies regarding the security of energy supply under a competitive market (Strategy Document for the Security of Supply of 2009) were among the steps that helped establish this framework.

One of the prominent attempts introduced by the Strategy Document of 2004 was the free consumer policy. It specified a smooth pathway towards a liberalized market by allowing transition period contracts between the free final consumers and the electricity retailers, while allowing consumers who are not free to be served only by the regional distribution/retailer electricity companies. The noticeable improvements to the EML of 2001 have been the foundation of a regulatory authority for the energy market – the Energy Market Regulatory Authority (EMRA) – and the vertical separation of generation and distribution functions; these have paved the way towards privatization transactions. The EML also authorized the EMRA to regulate and annually revise the consumption limits for the free consumers, which aimed to level the playing field for the retail competition.

The interventions of the Turkish Competition Authority (TCA) during the privatization of the publicly owned electricity distribution companies had a remarkable influence on the progress of a competitive market structure. Throughout the privatization process of 21 distribution regions, the TCA prevented a high level of concentration by establishing a market share threshold between 30 and 35 percent for the retail level. The involvement of the TCA in the privatization process was noteworthy as there were no other policy tools to prevent a private undertaking from a significantly high market power by acquiring all or most of the distribution regions.

One of the remarkable areas of progress following the privatization period has been the acquisition of one of the privatized regions (Osmangazi) by a Chinese company. Thus, it could be asserted that the Turkish electricity distribution and retail market is deemed to be promising for foreign investors.

Although the main path of the Turkish electricity reform followed to date does not have a unique feature that distinguishes it from the rest of the world, the indicators are encouraging. As a result of all the efforts, the public

share in the electricity generation fell from 85 percent in 1998 to 40 percent in 2013. By lowering the free consumer limits, market openness at the retail level increased from 23 percent in 2003 to 84 percent in 2013.

It takes two to tango: Electricity theft and tariff structure

Apart from the expected improvements in the electricity market, the retail level still has deficiencies and does not yet exhibit a sufficient level of competition. The current tariff regulation and the high level of electricity theft (and loss) may be claimed as the two major problems underlying this problem.

The EMRA regulates the tariffs, taking into account the different user groups (industrial, household, agricultural irrigation, families of martyrs, etc.) However, the point of interest here is that the tariffs approved by the EMRA reflect the prices introduced for the nation as a whole; that is, a national tariff is applied. The EMRA regulates the usage prices considering an equalisation mechanism by which it attempts to prevent the gap that would otherwise prevail between the cost-based prices and compensation of the underdeveloped regions. In this way, the regional cost differences are not taken into account, but this is not well-suited with the incentive regulation.

As a result of the equalization mechanism, the prices for different regions are set to be the same and the higher cost regions' losses are charged by the consumers of the other low-cost regions. The other side of the token is that the costs of the regions that have high level of electricity theft (and loss) are cross-subsidized by the regions with lower levels.

Although it is not difficult to identify different sources of motives for such a tariff policy (for example, social, economic or political motives), it is clear that in order to have the desired welfare gains from the privatization and liberalization efforts in an electricity market, much more effective and incentive-based mechanisms for tariff regulation must be developed. This is because the equalization mechanism and the cross-subsidizing policy are not sustainable in the medium and long term, although they may serve the short-term interests of the privatized firms by allowing them to recoup their high amount of bids.

The privatized distribution companies are under a regulatory obligation to reach the annual targets for theft and loss ratios to which they have committed themselves. Nevertheless, the comparison of the actual ratios and the committed ones indicates that the tariff policy of EMRA is

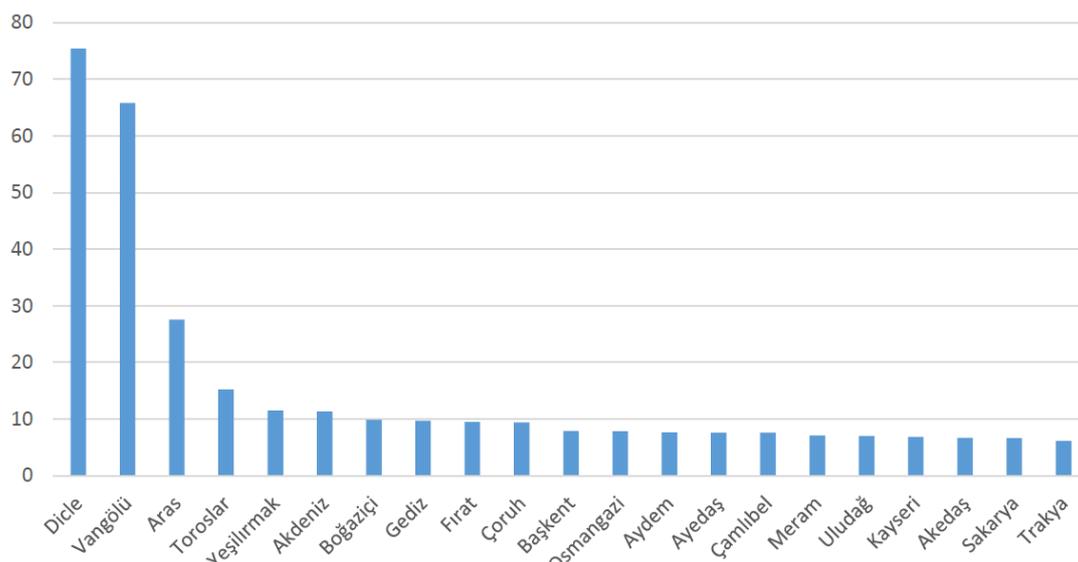


Figure 1: Loss and theft ratios in 2013 (percentage)
source: EMRA 2014

not well suited to overcome this imperfection.

Figure 1 illustrates the loss and theft ratios for the 21 regions in 2013. The figure clearly shows the level of regional differences regarding the loss and theft ratio is clear. The loss and theft ratios of the Dicle and Vanğölu distribution regions are so high that there is no need to try to explain the inadequacy of national tariff policy to cope with this difference.

The level of loss and theft ratios, which have not changed much over the years, and the commitments that have not been accomplished yet, particularly for the highest ratios, enable us to deduce that current tariff policy is not sufficient to incentivize the companies to lower them. It would not be wrong to be opposed to the existing regulation policy and in favor of a re-designed tariff regulation.

3. Winning the game: Don't change the rules, obey them!

The liberalization process and the electricity market reforms are helping to improve the social welfare of the Turkish people. Despite the insufficient state of the reforms, the abovementioned issues are awaiting a proper solution. Leaving aside the problems at the generation and wholesale level, a few suggestions could be offered with regard to the distribution and retail level.

Firstly, before re-organizing the current tariff regulation, the critical differences between the regional loss and theft ratios should be minimized. It seems almost impossible to reach an efficient level of competitive market structure without decreasing the loss and theft ratios of some regions in particular (namely, Dicle, Vanğölu, and Aras). In this context, reducing the free consumer limits will not

be a sufficient policy either. One way of dealing with the high ratios would be to develop tailor-made projects for the specific regions. Surveying the regions in detail and finding out the main motives behind the illegal electricity usage could yield practical data to develop such regional policies. As far as the authors could ascertain, such a detailed survey has not been carried out for the regions concerned, apart from a few worthy efforts.

Secondly, following the decline of the loss and theft ratios to the desired levels, it would be necessary to evaluate the current tariff policy and switch to regional cost-based tariff regulation. This tariff structure, combined with the competitive pressure from the independent retail companies, may have an incentive compatibility effect for the regional distribution companies to lower their costs.

Lastly, in order to have a competitive retail electricity market, it is also necessary to introduce an effective level of competition between the independent retailers and the retail firms of the current distribution companies. EMRA and TCA have faced cases regarding the anticompetitive practices of regional distribution companies against the independent retail companies. Beyond the sector specific regulatory interventions by EMRA, coordinated activities of the regulatory authorities (EMRA and TCA) are also essential to prevent the anticompetitive conducts of the regional distribution companies and clear the way for a liberalized electricity market.

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Regulating Electricity Markets via Competition Regulation rather than Sector-Specific Regulation: What are the Consequences in Turkey?

Dr. Muzaffer Eroğlu*

Great efforts have been made in many countries, including the EU Member States, other developed countries, developing economies, and also Turkey, to liberalise electricity markets and create a competitive business environment. Moreover, the EU has a specific agenda for liberalizing energy markets and creating competitive electricity markets¹. Liberalization and privatization have been among the main subjects of political debate and part of government agendas in many countries. Once the liberalization and privatization process had been completed in these countries, there was an expectation that a very competitive electricity market would emerge². However, even though the final aim of reaching competitive electricity market was clear, finding an efficient legal methodology and implementation of regulation for building competitive market has been problematic³.

The typical regulatory design for constructing competitive electricity markets has involved creating sector-specific regulations and granting power for all major policies to sector regulatory authorities. As a candidate country to the EU, Turkey followed the same path and introduced a very detailed electricity market regulation, starting from 2001, and established Energy Market Regulatory Authority (EMRA) to supervise the liberalization process and then oversee the market. Moreover, there has been a huge privatization program designed to reduce the role of state enterprises in Turkey's electricity sector. This privatization process has almost been completed; state companies' share has been reduced to a minority in electricity generation

(less than 30 percent)⁴. State companies play no role in the distribution and retail of electricity and they also have a minority share in the wholesale of electricity (wholesale and retail were separated until 2013).

As mentioned above, the process of liberalization and privatization in Turkey has been very similar to the process in the EU Member States. In the EU, however, enormous attention was given to complete liberalization and privatization while the aim of creating competitive electricity market was disregarded and competition regulation was sidelined for years. One of the reasons for this approach was the belief that sector-specific regulations would be sufficient to create competitive markets. Eventually, the electricity market has proved problematic from a competition perspective⁵. The underlying reason can be found in the mistake that the regulators made by basing the regulatory program on the idea that, once the market was liberalized and privatized, a competitive market would emerge. Non-realization of competitive market conditions caused immense debate in the EU and Member States. At the same time, existing competition regulation was utilized to ease some major structural problems that hindered the competition⁶. However, as the market had already settled and there were many competition problems, reaching a competitive electricity market in the EU required more regulatory reform⁷. As a result, this debate process produced more complex regulation at the EU level.

In the case of Turkey, a different approach was taken in the creation of a competitive electricity market. In terms of its regulatory approach, the EMRA has been obliged to create competitive energy markets. The rules regulating the market consist of many requirements that aim to accomplish a competitive electricity market. However, as it

4 All statistics can be found at Turkish Energy Market Regulatory Agency website: <http://www.epdk.org.tr/index.php/elektrik-piyasasi/yayinlar-raporlar>.

5 See further for EU Inquiry pursuant to Article 17 of Regulation (EC) No 1/2003 into the European gas and electricity sectors. COM(2006)851 final.

6 For some example cases, see the EU Commission website at http://ec.europa.eu/competition/sectors/energy/overview_en.html#cases.

7 In the EU after sector inquiry there was another energy legislative package: <http://ec.europa.eu/competition/sectors/energy/inquiry/index.html>.

1 Even the Introduction of European Commission's Energy Internet Website starts with "Secure, Competitive and Sustainable Energy." For more on EU Energy policies, see <http://ec.europa.eu/energy/en/topics/energy-strategy>.

2 Martin Hellwig Competition Policy and Sector-Specific Regulation for Network Industries, Max Planck Institute for Research on Collective Goods Bonn 2008/29. See <http://www.coll.mpg.de/publications/competition-policy-and-sector-specific-regulation-network-industries>.

3 Peter Van Doren, 2000. "Making Sense of Electricity Deregulation", Regulation, 23 (3), Cato Policy Institute. See www.cato.org/pubs/regulation/regv23n3/vandoren.pdf Paul L. Joskow Lessons Learned From Electricity Market Liberalization The Future of Electricity: Papers in Honor of David Newbery: The Energy Journal, Special Issue 2008.

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has already been shown that sector-specific regulation cannot create the expected level of competition, competition regulation and the Turkish Competition Authority (TCA) played an important role in the process. The TCA was directly involved with the liberalization and privatization process from the beginning because leaving the duty of creating competitive market to sector-specific regulation alone would not be functional. The privatization process in Turkey has proven that a more efficient option, which offers more long-lasting solutions, is to create a competitive electricity market via competition regulation.

I. Market Distortions for Competition in Electricity Sector

In order to examine competition problems, it is essential to identify the main market distortions in electricity markets. The basic problem is being dependent on network system; there is a requirement to have universal utilization of the same infrastructure⁸. Being dependent on a network raises problems of misuse of monopoly rights and anticompetitive behaviors of network operators, mainly by preventing access to the network or by discriminating amongst users of the network⁹. The second problem is the abuse of dominant position by incumbent undertaking. In particular, after liberalization the incumbent (mostly vertically integrated) exercises its power on the generation and retail markets with agreements and pricing policies in order to force its rivals out of the market.

The third problem is the market entry problem. There are several barriers to entry into electricity markets, such as economic scale and extensive regulation¹⁰. The market entry problem causes the fourth problem, which is the horizontal concentration problem; namely, there are mainly oligopoly market structures, especially in upstream generation and downstream retail markets, which have to be competitive. Even joint dominance is very likely. Moreover, a complicated shareholding structure appears with complex minority shareholding and joint venture structures¹¹.

The fifth problem, which is usually unsolved, is the existence of vertical concentrations or the emergence of new and more complex vertically concentrated energy groups. This especially involves the bundling of upstream

8 Hellwig Martin, Competition Policy and Sector-Specific Regulation for Network Industries, Max Planck Institute for Research on Collective Goods Bonn 2008/29. See <http://www.coll.mpg.de/publications/competition-policy-and-sector-specific-regulation-network-industries>

9 Kotlowski, Alexander, 2007. Third-Party Access Rights in the Energy Sector: A Competition Law Perspective. *Utilities Law Review*, 16 (3). Available at SSRN: <http://ssrn.com/abstract=1073962>.

10 See, for example, the detailed analysis at ACER/CEER Annual Report on the Results of Monitoring the Internal Electricity and Natural Gas Markets in 2012

11 For more, see EU Inquiry pursuant to Article 17 of Regulation (EC) No 1/2003 into the European gas and electricity sectors. COM(2006)851 final.

markets with lower level markets; for example, bundling network and infrastructure services with generation and retail markets. This causes misuse of dominant positions in network and infrastructure in order to strengthen their positions in generation and retail markets¹². This problem requires that more attention be paid to the lack of legal and/or ownership unbundling¹³.

Another issue regarding uncompetitive electricity market is convergence, especially electricity and natural gas convergence. This problem is neglected by sector-specific authorities, as their approach to regulation is mostly more technical and narrower and considers electricity or gas as separate sectors¹⁴.

There are great similarities between the electricity sector and other sectors based on networks, such as communication, transportation, ports, and railroads. Lastly, one can argue that all these problems are very similar to each other in all countries. Thus, comparing their regulations makes more sense in the electricity sector.

II. Turkish Electricity Market Law and Competition

Building sophisticated sector-specific regulation requires that structural problems of competitive electricity markets are solved from within. This approach can be seen even in the first article of Turkey's Electricity Market Law (EML), which reads: "The purpose of this Law is to ensure the development of a financially sound and transparent electricity market operating in a competitive environment under provisions of civil law and the delivery of sufficient, good quality, low cost and environment-friendly electricity to consumers and to ensure the autonomous regulation and supervision of this market." Moreover, the Law Regarding Organization and Duties of Energy Market Regulatory Agency sets one of the main duties of the EMRA as the facilitation of a competitive electricity market. As a result, there are several references to this duty within the law and by-laws.

A. Competition Regulations within the EML

Having already been alerted that several problems exist, the EML has introduced several ex-ante measures to faci-

12 Van Driessche, Lothar, 2011. Unbundling under the 2nd and 3rd Energy Packages and its Effects on Corporate Behaviour in the Energy Sector (September 5, 2011). MBL-FU Master Paper Series. Available at SSRN: <http://ssrn.com/abstract=2289805>.

13 Bogner, Stefan, Gasser, Stephan M., and Rammerstorfer, Margarethe, 2012. M&As in European and North American Energy Markets: Implications for the Assessment of Legal and Ownership Unbundling – An Event Study Analysis (September 14). Available at SSRN: <http://ssrn.com/abstract=2146590>.

14 Künneke, Rolf W., 2009. Convergence of Gas and Electricity Markets: Economic and Technological Drivers. In *Handbook Utility Management*, Springer, pp. 263–278.

litate competition in the electricity market, which can be classified under three basic principles.

According to the EML, there is a principle of open, non-discriminatory access to networks, and tariff control for monopolies. The aim of this principle is to prevent network operators from abusing monopoly rights. It is also important to provide access to the market by guaranteeing open access for essential facilities. Consequently, there are several provisions within regulations to provide open and non-discriminatory access to transmission and distribution networks and control of tariffs for these services.

Another principle taken by the EML is the introduction of market caps within the EML. Accordingly, no undertaking can own more than 20 percent of generation capacity in Turkey and no undertaking can own more than 20% of retail capacity. Even though it is contrary to free market principles, the aim of the market cap rule is obviously to prevent horizontal concentration. Moreover, the cap of 20 percent is a more severe measure than competition law would impose. Having already strict market caps means, in theory, that there is no requirement for concentration control; all mergers and acquisition and new licensing will be evaluated accordingly and most concentrations will be prevented by the EMRA even before the TCA control.

The third main principle introduced by the EML is unbundling. Under the EML, several measures are taken in order to unbundle services. The main policy in the law is legal unbundling, which sometimes comes with organizational unbundling. There is also de facto ownership unbundling, as the transmission company with a monopoly right remains a state-owned company and the energy exchange monopoly company is mixed owned but controlled by Borsa Istanbul. With regard to legal unbundling, generation, distribution, and retail services are required to be legally unbundled (permission to vertical concentration). However, there is a requirement for organizational unbundling between distribution companies and a designated retail company (under the same ownership with the distribution company) and generation companies; these companies under the same business groups must have separate managements. Distribution companies must appoint separate management teams from retail companies and the members of these teams cannot have any management connection to generation and retail companies. Additionally, extensive power is granted to the EMRA to impose further unbundling requirements: "In order to facilitate competitive market, the EMRA can introduce rule and standards to regulate relationships amongst undertakings; and if these standards require, ownership, legal or account unbundling, take necessary measures."

III. Persistent Problems that cannot be solved by the EML and require Competition Law Intervention

Despite increasing regulation in order to establish competitive electricity markets, several problems remain unsolved¹⁵. The first regards the definition of undertaking and dealing with joint ventures and the shareholding structure of energy companies. The EML regulates companies while competition law regulates undertakings. Another problem is the definition of the market; while electricity market regulation simply defines a few main services, competition regulation usually has several sub-level market definitions. This changes the method of dealing with horizontal concentration by considering market definitions, which includes upstream and downstream markets (such as regional markets or markets based on energy source portfolio). Another problem is associated with vertical concentration; because there are very few requirements for ownership unbundling, any business group might own vertically integrated energy companies (even though they are legally unbundled). Therefore, huge efforts have been made to unbundle energy groups within Europe and other countries. As a result, even though networks are somehow unbundled from other services, there is still a strong concentration between generation and retail, which must be dealt with. Another important issue to be considered is the convergence problem. In particular, by converging natural gas services with electricity services, energy groups could create sector giants that eventually cause huge market entry problems. While convergence is one of the most vital issues for a competitive market, sector-specific regulations have no rules regarding convergence.

IV. Competitive Electricity Market in Turkey: The TCA Interference

According to the general principles of competition regulation, the TCA ex-ante interferes with the electricity market while applying control of concentration, and ex-post while investigating of competition infringements. In both stages, the TCA may demand structural and behavioural remedies to create a competitive market environment. Even though the universal power of the TCA for electricity market is well settled by Turkish Council of State decisions, intervention by the TCA might create conflict between the market regulatory authority and the competition authority. Rather than going through a number of decisions by the TCA regarding electricity market, I will examine the approach taken by the TCA in order to solve main competition-related problems and potential struc-

15 The TCA published an Electricity Sector Report in 2015. See [http://www.rekabret.gov.tr/File/?path=ROOT%2F1%2FDocuments%2FG%C3%BCncel%2FDiger%2FELEKTR%C4%B0K+SEKT%C3%96R+RAPORU+08+01+2015+\(3\).pdf](http://www.rekabret.gov.tr/File/?path=ROOT%2F1%2FDocuments%2FG%C3%BCncel%2FDiger%2FELEKTR%C4%B0K+SEKT%C3%96R+RAPORU+08+01+2015+(3).pdf).

ture of the market.

TCA approach regarding horizontal concentration: Since 2001, the TCA has been involved with the privatization of distribution companies (it was bundled with retail services) and generation companies. There are 21 distribution monopoly regions and only one single transmission company in Turkey. Even before privatization, the initial aim of the TCA was to create ownership unbundling between distribution and retail. However, this idea was ignored by the privatization authorities. After bidding was completed, the TCA introduced several conditions for bundled distribution and retail companies to be transferred to private owners. These conditions were supplementary to existing ones within electricity regulation.

Accordingly, regarding the distribution and retail markets, the TCA stated that distributions services are natural monopolies and are heavily regulated; this means that, in theory, ownership concentration should not matter. However, the privatization of bundled company with distribution and retail services meant that the privatization of retail market is a good deal. In view of that, the TCA stated that the electricity market contains two competitive services: generation and retail. Thus, horizontal and vertical concentration and the structure of electricity company groups are essential to competitive markets and should be examined carefully. Moreover, in retail services, consumers' freedom of choice would be established as non-free consumers would soon disappear (from 2016). Thus, the market share of the designated retail company (bundled with the distribution company) is crucial, as they were privatized with current customer portfolios. More to the point, with the careful examination of reciprocal agreements in the electricity sector, the power of privatized retail companies as buyers and sellers would play a significant role, at two levels. First-level commercial activity happens between generation and retail companies. At this level, buyer's power (especially retail companies' power) is important. Second-level commercial activity happens between retail companies and end users. Here, the market portfolio of retail companies has to be restricted, as markets would be free in a few years' time and must remain competitive. Accordingly, even though there was no market cap in law for distribution portfolio (bundled with retail), the TCA introduced a market cap of 30 percent of Turkey. This decision is important as several electricity groups with retail services currently exist in Turkey.

Regarding the privatization of generation capacities, many such decisions have been made regarding small, medium, and large generation companies in recent years. More than 30 percent of the total capacity in Turkey was transferred to private companies. Generation services are very dispersed in Turkey, with the largest group (after the

state company) owning approximately 8 percent of the total capacity. However, the TCA still conducts a detailed examination by considering portfolio-based market share and the share of groups in narrower relevant geographic markets. The TCA hinted that it would not permit regional generation concentration or portfolio-based generation concentration¹⁶.

The TCA approach regarding vertical concentration: The TCA conducts a very detailed examination for the portfolio of the undertakings for generation and retail. The TCA stated that there could be competition problems if generation and retail are concentrated under the same group without determining the threat limit of vertical concentration. Since no energy group owns more than 8 percent of generation, no decision has been made regarding the upper limit of concentration.

The TCA approach regarding converging markets: The TCA stated that electricity and natural gas are very strictly connected markets; this is because, in retail markets, electricity and gas providers can be strong potential competitors. Also, electricity and gas retail companies indicate similar market conditions and undertaking structures. Accordingly, the TCA decided that, after careful examination of the ownership structure of companies' gas distribution areas, convergence of gas and electricity retails in the same geographical area would not be permitted.

The TCA approach regarding access to networks: Since market liberalization and privatization processes have started, there have been many complaints regarding competition infringements. These complaints have mostly regarded the abuse of monopoly positions by vertically integrated electricity companies and the avoidance of agreements for essential facilities by denial or discrimination of access to networks. Moreover, there are several complaints regarding margin squeeze. These complaints prove that sector-specific regulation is not efficient to prevent network abuse because market regulation only covers certain abuse of network possibilities. However, undertakings are very inventive in terms of finding unregulated or grey areas for denying access to a network. It is well known that competition regulation considers not only regulated access rules, but also every aspect of network operation. Therefore, one can easily conclude that the flexible design of competition laws makes it better equipped to counterchallenge the ongoing problems, and more suitable to regulate network access.

Comparative Examination of the EU Competition Cases: Recent decisions regarding electricity markets in the EU taken by the Commission and by national Competition Authorities in some Member States have proven that

16 See, for example, the TCA Decision regarding Hamitabat Generation Plant in 2013 Case no: 13-17/247-122.

market-specific regulation should be abandoned in favor of competition regulation. For example, one of the most important cases regarding competition law infringements in the EU was the German electricity market decision¹⁷, which highlights several reasons why market-specific regulation failed. First, the market-specific regulation could not prevent the emergence of a very concentrated market. Once the regulation failed to create a competitive market, it caused more competition problems. In the German case, E-ON, RWE, and Vattenfall had a total of 77 percent of generation (especially cheap generation). Moreover, it was very difficult to enter the market due to the idle capacity and connection of undertakings to each other through ownership and long-term contracts.

Accordingly, this structure was causing manipulation in spot markets through the abuse of dominant positions by capacity withdrawal, as undertakings were intentionally not using some generation facilities (especially cheaper ones). This affected competition in the entire electricity sector as spot market manipulation affects the reciprocal agreement market and the derivative market. Also, horizontal and vertical concentrated undertakings were so powerful that they deterred rivals from investing by offering them long-term contracts or selling them minority shares. Another problem was vertical concentration, as the transmission network (and therefore the stabilization market) was owned and operated by a company group (E-ON) that also owned a lot of generation and retail capacity.

As a result, the Commission had to interfere with the structure of undertakings in order to find a long-term solution by imposing structural remedies. Accordingly, undertakings were forced to transfer some generation capacity (different portfolio) in order to reduce horizontal concentration. Additionally, in order to reduce the level of vertical concentration, E-ON was forced to handover the transmission and operation of exchange companies to independent third parties.

V. Predicting the Future in the Electricity Market: Why Competition Regulation should be used

The constant changes in technology and market conditions mean that the electricity market is very dynamic. However, sector-specific regulation is based on static rules rather than principles. Hence, even though the definition in sector-specific regulation hardly changes, from a competition law perspective there is a constant change in market definitions. For example, downstream market definitions within the universal market, regional markets, or portfolio-based definition for generations, or marketing channels for retail can be defined differently. Consequently, an important challenge is preventing concentrations within the downstream sections. Also, when the technology, generation, and marketing structure change, there could be new market definitions. For example, convergence is a critical challenge to market definition. Electricity retail and gas retail can be defined as a single market. Thus, from a competition law perspective, the existence of the gas retail market as a potential rival to electricity retail is essential. In this scenario, horizontal concentration can only be prevented by competition regulation.

On the other hand, past experience indicates that market consolidations are imminent in electricity sectors, which makes it more likely that a market will have horizontally and vertically integrated energy giants with an oligopolistic market structure. As a result, there is a constant change in the structure of undertakings, resulting in a more complex ownership structure with joint ventures and minority shares. Therefore, only competition regulation and competition authority and competition regulation are able to solve this problem, by taking dramatic measures such as forbidding minority shareholdings in competing companies.

Another important expectation is that, as long as there is a strict rule for ownership unbundling, there will be a rush to vertical concentration of distribution, generation, and retail. This raises the question of how best to apply unbundling rules, as the whole idea behind unbundling is facilitating a competitive market. However, as unbundling is conducted by sector-specific regulation, there is always a gap. Thus, more strict and up-to-date solutions can be produced by competition regulation because there is a requirement to introduce dramatic structural and behavioral measures.

Past experience has also shown that access to networks will always be problematic and cannot be solved by static rules of market-specific regulation. Thus, competition authorities are better qualified than sector-specific regulators to determine access to network conditions, as any use of networks could demonstrate different characteristics over time and in line with technological developments.

In conclusion, the Turkish experience and comparative examination prove that detailed competition rules in sector-specific regulation make the operations of the electricity markets more complicated for regulators, authorities, and undertakings. Sector-specific authorities do not have the basic understanding or the regulatory tools necessary to apply competition at expected level. When competition authorities interfere, this usually conflicts with sector-specific regulations and conflict of authority may even arise

between authorities. Undertakings are confused because, despite obeying the decisions of the market regulatory agency, they might still be subjected to competition authorities' scrutiny and sometimes harsh decisions. In order to create competitive electricity market, competition rules in sector-specific regulation should be abandoned and more general principles based on competition regulations should be applied in electricity markets.

Fixed-Mobile Substitution in the Turkish Telecommunications Market

Fuat Oğuz*, Erman Benli**

1. Introduction

Fixed-mobile substitution (FMS) has been one of the most important issues in telecommunications markets in recent years and has had significant impacts on the regulatory governance in the EU and Turkey. While technology and the economic structure of telecommunications markets have changed substantially with FMS, regulators have tended to take a conservative attitude toward FMS. This attitude is not neutral among market participants. The divergence between economic structure and legal environment has a redistributive effect on telecommunications markets. As fixed and mobile markets have become close substitutes in terms of consumer preferences and supply-side considerations, the distinction between mobile and fixed networks has lost its importance in terms of market demand. Despite this, regulatory regimes have remained suspicious of the consequences of FMS, and the asymmetry between regulatory frameworks and market realities has opened doors to wealth transfers and rent-seeking activities in these markets. Regulatory process has turned into a strategic game between operators and regulatory agencies (Cetin and Oğuz, 2007: 1763).

Turkey is no exception to this trend. The Turkish regulatory agency – the Information and Communications Technologies Authority (ICTA) – continues to analyze relevant markets under the conventional theories of natural monopoly and bottleneck monopoly. However, these theories have become questionable with the emergence of FMS. The bottleneck monopoly of the fixed line network no longer exists. All of the major variables in the market show the existence of FMS.

A recent article on the regulatory policy in telecommunications asked, ‘Is fixed-mobile substitution strong enough to de-regulate fixed voice telephony?’ (Briglaier et al., 2011). At the time that article was published, the question was more relevant than it is now, given that FMS is stronger now. Incumbents in many countries still thought

there was chance to keep incomes growing, even if market shares were falling. The changes in the last two years have solidified FMS around the world. Technological advances have pushed consumers to mobile networks. Moreover, mobile operators have had the advantage of being in a competitive market, whereas fixed operators were tightly regulated. Consequently, the asymmetric regulation accelerated FMS, particularly in countries with highly competitive mobile markets.

In many developed countries, FMS in voice is now well established. Data services have followed the same historical trend in terms of substitution and convergence of services. The evidence in broadband is ambiguous and the issue has not been settled yet. Apparently, broadband has also followed the path of voice. In Austria and the Czech Republic, for example, national regulatory authorities endorsed FMS in broadband and these decisions were supported by BEREC (BEREC, 2012). However, the EU Commission took a negative attitude toward FMS in broadband, which created a tension between BEREC and the EU Commission.

Since FMS, it has become important to ask whether there is a case for deregulation of fixed and mobile broadband markets. If so, the regulatory challenges and the inertia of regulatory authorities make the regulatory environment an impediment to competition.

If fixed and mobile services were substitutes, different regulations would not be appropriate and would have anti-competitive effects. Both regulatory and competition policy toward telecommunications industry would have to be redesigned. This would necessitate a new market definition.

Until recently, the literature referred to the changing environment in telecommunications markets and convergence between alternative platforms. Intermodal competition was expected. The question to discuss was what

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would happen if the new institutional framework replaced the old rationale of *ex ante* regulation (Shelanski, 2007). Telecommunications markets have reached a point where the bottleneck monopoly of fixed-line networks is expected to be something of the past. In most countries, however, the regulatory environment has remained intact.

As a result of these changes, both national and international regulators face a dilemma. The divergence between the policy goals of embracing technological advances and protecting jurisdictional powers of regulatory bodies creates regulatory difficulties. The divergence between economic reality and legal framework encourages rent-seeking activities (Barzel, 1997). The increasing distance between economic incentives and regulatory structure creates asymmetric regulation between firms competing for the same consumer base.

In principle, the implementation of any regulation must be on the basis of its effects on social welfare. It has to create net social benefits. This principle requires regulatory impact assessment (RIA) to be part of decision-making. The lack of RIA in most decisions appears to be one reason why regulators remain reluctant to change anti-competitive regulations. FMS provides a good illustration of the drawbacks of keeping the old regime despite changes in the market structure.

2. Stylized facts on FMS

This section highlights the major findings of the literature on FMS, without offering a detailed discussion of the literature.

First, as markets evolve and saturate, substitution becomes dominant. In 2005, for example, demand elasticities for fixed-line services were lower than those for mobile services (Garbacz and Thompson, 2007; Vogelsang, 2010). This has since changed. Mobile phones, as part of the culture of the modern consumer, have become more important than fixed phones (Gideon and Gabel, 2011; Grzybowski, 2012). FMS starts in usage and then moves to access. Consumers initially keep their fixed-line phones and increase their usage of mobile phones, before eventually “cutting the cord” on their fixed phones. As a corollary of the evolving and saturation of markets, network externalities lose their importance as the country becomes more developed. This aspect of transition weakens the natural monopoly-based arguments of regulatory authorities.

Second, substitution is not transitory but redefines the telecommunications markets. FMS is not just a change in subscriber or traffic numbers. The behavioral patterns of consumers shift toward mobile-only services. The institutional structure of telecommunications markets evolves into a market setting other than the traditional natural monopoly model. Empirical studies find that access is more inelastic than calls (Briglaue et al., 2011). Empirical studies tend to underestimate FMS, as they mostly use mobile and fixed-line subscription numbers rather than disaggregated traffic data.

Third, substitution is self-enforcing. FMS increases faster because of network effects and its effects on relative prices (Vogelsang, 2010). Supply-side cost reductions and demand side price effects make FMS stronger. The increasing role of relative prices in determining consumer choices also reflects the fact that the quality of service in fixed and mobile services are becoming closer. In many countries, mobile operators offer broadband internet service at prices (for the same download speeds and limits) similar to fixed-line operators.

Fourth, over-regulation increases social costs of regulation. While FMS gets stronger, regulators do not usually take a proactive position on the issue. Mobile telecommunications markets are lightly regulated compared to fixed-line markets around the world (Barth and Heimeshoff, 2012). The divergence creates two negative effects. First, the existence of asymmetric regulation encourages rent-seeking activities for wealth transfers. Mobile operators can offer products to the market very quickly. Fixed-line operators must usually go through a lengthy regulatory approval process. Second, it gives way to over-regulation. Regulators make rules more complicated and detailed rather than revoking them to resolve market failures. The limited applicability of RIA makes accountability of regulatory policy difficult. While the economic consequences of FMS support the deregulation of fixed networks, the existing regulatory environment increases the costs of improving competition in the telecommunications markets.

3. The Turkish Experience

FMS is one of the most crucial issues in the Turkish telecommunications market. It was not until 2014 that the ICTA endorsed the existence of FMS. In that same year, the ICTA conducted a survey on a number of issues in telecommunications including the existence of FMS. The survey signaled the existence of FMS in voice. As a result,

the ICTA deregulated fixed voice at the retail level in its third round of market analysis. However, the economic reality of FMS has not materialized in the regulatory process of market definition. The ICTA still defines the relevant market contrary to the reality of FMS. On one hand, the agency determines the existence of FMS and to deregulate the retail fixed voice market. On the other hand, ICTA does not endorse to define the mobile and fixed voice as a single market. It causes an inconsistency between economic and legal rights and encourages operators to lobby for wealth transfers.

This inconsistency has slowed down the improvement of competition in the Turkish telecommunications industry. The ICTA should redesign its market definition for relevant markets in accordance with FMS. Otherwise, the asymmetry between regulations and market realities will become an arena for strategic behavior between operators and government.

Turkey's regulatory framework has been established on the same pillars of the EU, but the ICTA applies a three-criteria test, starting with the wholesale levels. However, the market analysis should begin with the retail markets. If the retail market is sufficiently competitive, the regulation of the wholesale market becomes unnecessary. However, the ICTA's approach assumes that bottleneck monopoly and natural monopoly are still the theoretical underpinning for its market analysis. It generates a complex regulatory structure that is inconsistent with the economic reality. The economic reality of FMS, which was endorsed by the ICTA, does not address the fundamental problem as it rejects defining the relevant market as single-voice market. If the ICTA endorses the single-voice market, any operators – including the fixed-line incumbent, Türk Telekom – would not be an SMP operator or dominant undertaking. Redesigning the relevant market definition in parallel with the reality of FMS shows the competitive structure of a single-voice market. The ICTA's approach has created an artificial relevant market that is contrary to the existing substitution between fixed and mobile networks.

The Turkish Competition Authority (TCA) has also resisted accepting the existence of FMS. TCA does not endorse the reality of FMS and has resisted redesigning a relevant market definition as a single-voice market. In a recent decision, the TCA hypothetically analyzed the relevant market as a single-voice market and found that the largest mobile operator, Turkcell, was not a dominant firm in the relevant single-voice market. In other words, none of the undertakings is dominant in the single-voice market. The problem with TCA's approach is that it endorsed the single-voice market as a hypothetical analysis but does

not endorse it in reality.

FMS in broadband in Turkey is also an important phenomenon given the significant number of subscribers to mobile internet services. Penetration rates between fixed and mobile also support the argument in favor of FMS in broadband. Contrary to the FMS in voice, ICTA does not endorse FMS in broadband (ICTA, 2013: 79). It does not define or regulate the broadband internet services at the retail level. The strong relationship between FMS and market definition indicates that the deregulated broadband internet services market at the retail level theoretically proves the existence of FMS in broadband. ICTA regulates the wholesale broadband access market as it does in the wholesale market. It has determined Türk Telekom as the SMP operator. ICTA's problematic point of view for the voice market exists for the FMS in broadband as well. In a similar vein, TCA also rejects FMS and the definition of a single broadband market in its relevant product market analysis in the cases of Türk Telekom and TTNET, a subsidiary of Türk Telekom and incumbent operator for wireline broadband market, which were accused of abusing their dominant position in the vertically integrated broadband market.

In sum, even though the economic reality of FMS compels national regulatory authorities to redefine and redesign the relevant markets, ICTA still continues to define relevant markets in a conventional manner. This approach creates an inconsistency between the economic reality and conventional market definition based on the theories of bottleneck monopoly and natural monopoly. The result is a decrease in social welfare and an increase in transaction costs for market participants.

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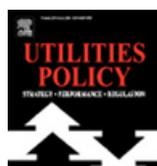
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