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Unintended Consequences of Interventions in Electricity Production and Consumption.

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Abstract

Government interventions are contradictory theme in economic science. Subsidies and price control in electricity production and consumption are justified to “treat” negative externalities such as climate changes, security of supplies, innovation or unemployment issues. Many authors contradict such a treatment and prove to be ineffective. Our main focus in this article is to analyze interventions and their consequences in electricity market in Slovakia. We refer to claim of Mises, that intervention produces unintended consequences, leads to escalating price fixing and at the end it eliminates the market altogether. We examined intention, goals and tools of Slovak regulatory agency and proved those are unduly determined and will not lead to desired ends. We have proved that real outcomes of this policy had led to unintended consequences such as excess of production facilities, declining prices of electricity, decreased profitability of all producers and exit from market of marginal production sources that are not subsidized. We applied mainly Austrian economic school methods, based on methodological individualism, dualism, apriorism and deductive logic, supplemented by descriptive statistics, comparative and classification analysis.

Keywords: competition; interventions; price control; submarginal production; Subsidies;

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1. Introduction

When we look at the economy, we might see uncountable number of exchanges taking place every day. Economic agents trade exchangeable goods and services with aim to benefit from it. As Mises (1996) points out, “acting man is eager to substitute a more satisfactory state of affairs for a less satisfactory. His mind imagines conditions which suit him better, and his action aims at bringing about this desired state”. Exchanges can be generally split into two main categories: voluntary and coerced. In voluntary exchanges, both parties must benefit, otherwise the exchange would not take part. Obviously, we all live in the state where laws and legal system creates another type of intervention – a legal one. This type of intervention is generally undertaken by some form of government or its related agencies.

Neoclassical economic theory provides the explanation and general justification of governmental intervention as “treatment” of negative externalities such as environmental issues, collective goods and market failures. On the contrary, Austrian economic school of thoughts represented by Mises (1996), claims that intervention produces result contrary to its purpose and makes conditions worse, not better. If the government is unwilling to admit its’ failure and goes further and further and fixes the prices of all goods and services and wage rates, it eliminates the market altogether. Then the planned economy or socialism is substituted for the market economy. The consumers no longer direct production by their buying or not buying but the government does.

According to Rothbard (2009), government as legal intervener can execute three types of interventions: autistic, binary and triangular. Autistic intervention restricts the subject’s use of his property when exchange is not involved. Secondly, binary intervention is a hegemonic relation established between two people: the intervener and the subject. The intervener may compel an exchange between the individual subject and himself or coerce a “gift” from the subject. Thirdly, triangular intervention occurs when the invader either compels or prohibits an exchange between a pair of subjects. *Price control* is a type of triangular intervention and is generally executed by special government agency that is authorized by law to attain the ends and goals of intervener. The intervener may set either a minimum price below which a product cannot be sold, or a maximum price above which it cannot be sold. He can also compel a sale at a certain fixed price. As Henderson and Poole claim (1991), the chief tool of regulation is price control. *Subsidies* represent binary intervention. If government agency provides subsidies directly to entrepreneurs, it makes “rational economic planning” of who, what, how and when is produced and consumed (Mises, 2012). Their aim is to stimulate selected entities to create jobs, enhance competitiveness, support innovation, etc. by allocating public funds. This redistribution withdraws resources from agents competing in free markets (by taxation) and is assigned by non-market bureaucratic decision. Hazlitt (2008) argues that government is actually taxing successful entrepreneurs to subsidy unsuccessful entrepreneurs. McTuigue (2012) complements that most of subsidies are compensation payments for things in economy that needs to be fixed and Horehaj (2008) claims that interventions might disrupt dynamics of economic processes. According to Mises (1996), for every unprofitable project that is realized by the aid of the government there is a non-realized project that would have been profitable, i.e., it would have employed the scarce means of production in accordance with the most urgent needs of the consumers.

Production of economic goods can be organized in uncountable ways. Discovery process of entrepreneurs (Kirzner, 1997) reveals which combination of production factors is the optimal for the consumer in terms of price and quality. Indicator of how successful the entrepreneur is we find in profit and loss signals. Profit attracts new competitors to the industry and loss withdraws production factors and redirects them to more efficient use. When government’s interference enables submarginal producers to start or continue production and to stand the competition of more efficient entrepreneurs, the magnitude of total production and of total wealth is curtailed. Products at higher costs are brought into existence or preserved while other products at lower costs are forced to curtail or to discontinue their production. The consumers are not getting more, but less (Mises, 1996).

2. Material and methods

Our main focus in this article is to analyze interventions and their consequences in electricity market. We refer to claim of Mises, that intervention produces unintended consequences, leads to escalating price fixing and at the end it eliminates the market altogether. The consumers no longer direct production by their buying or not buying but the government does. We review reasoning of interventions (intention) and evaluate if the government means are appropriate to reach desired ends. We examine how binary interventions (subsidies) and triangular interventions (price control) influence competition, prices, profitability of producers and consumers' utility. As electricity market in Slovakia is partially regulated, we will focus on production and consumption, not distribution and network services. Subject of our research is government support of electricity producers from renewable energy sources. Those include subsidies provided by EU/Slovak Operational program "Competitiveness and economic growth 2007-2013" (OP C&EG) and price regulation decrees by Slovak URSO (government regulatory agency) based on Slovak Act 309/2009. As material we use secondary data from Slovak URSO, Eurostat and Slovak statistical bureau (prices and their elements), Slovak and EU legislative acts, SEPS a.s. annual reports, prices from PXE and EEX exchanges and data from Ministry of Economy of the Slovak Republic. We apply mainly Austrian economic school methods, based on methodological individualism, dualism, apriorism and deductive logic, supplemented by descriptive statistics, comparative and classification analysis.

3. Results and discussion

Electricity market development in Slovakia and EU. Slovak electricity market went through a substantial transformation over a past decade (2005-2015). Former natural monopoly from socialist era – single government owned entity had been split into several subjects, which were later partially privatized. This unbundling process enabled separation of electricity production, distribution and sale (supply). National legislation and EC directives opened electricity market for new producers, wholesale traders and retailers. This liberalization performed in most EU countries brought cross-border trade and more competition and this resulted in production prices decrease. Cross-border trading in central Europe started in year 2008, when Prague's Power Exchange Central Europe (PXE) expanded its operations from Czech Republic to Slovakia (now also includes Hungary, Poland and Romania). Trading was also expanded to second relevant exchange for central Europe region - Leipzig's EEX. Electricity production prices took since then a significant decline in both exchanges. Between years 2008 and 2015 the price declined by 60 % (Source: PXE and EEX price lists Nov 1, 2015).

The Intervention. Desired ends and means used. Substantial decrease of electricity production price can be explained by influence of two factors. On demand side, great recession caused contraction of consumption which represented 8 % yearly decrease in Slovakia in period of 2009/2008. Second factor was on supply side – new production facilities were created as response of EU stimulus of supporting renewable energy sources. This stimulus of EU and national government is the object of our investigation. When we make detailed analysis of legislative act (Directive 2009/28/EC of the European Parliament and of the Council "on the promotion of the use of energy from renewable sources") we can identify numerous answers for desired ends that the policy makers intended to reach. We have summarized those in four main categories: (a) Environmental; „to reduce greenhouse gas emissions and comply with the Kyoto Protocol to the United Nations Framework Convention on Climate Change, and with further Community and international greenhouse gas emission reduction commitments beyond 2012"; (b) Security; „promoting the security of energy supply"; (c) Innovation; „promoting technological development and innovation, the promotion of new infant technologies"; (d) Employment; „providing opportunities for employment and regional development, especially in rural and isolated areas". The directive had set up a target of 20 % share of energy coming from renewable sources in gross final consumption of energy in European Union to be reached by year 2020. Target includes three areas of consumption – electricity, transport and heat/cooling. Each member state agreed „road map", which coordinates all countries to reach this

target. Slovakia made also obligation to increase renewable sources from level of 6,7 % (as starting point in 2005) to 14 % by year 2020.

First discrepancy, we refer to, is that EU and national governments had set up unsound overall goal (20%). Climate change is caused (partially) by greenhouse gas emissions (Raupach et. al, 2007) that include two major anthropogenic forcing fluxes: (i) fossil fuels combustion and industrial processes and (ii) the flux from land use change (land clearing). Taking this into consideration, the policy will not guarantee reduction of carbon dioxide even if the 20 % goal is reached, but only will provide indirect potential to reduction. In reality, the effect will be a replacement of least economically profitable (marginal) energy source with supported and guaranteed new RNE source. Except this pure economical reason, there are more dangers in terms of contradictory national energy policies, like in Germany. So when its' "Energiewende" program will replace 16 % nuclear source market share (2014) in energy mix with new 26 coal power plants by year 2022, despite of reaching EU/national controversial target, greenhouse gas emissions will be definitely higher than at the start of the policy implementation.

So making conclusions on environmental aspect, even before examining further data, we might state that interventions in form of 20 % target policy is not an appropriate mean to attain the ends of greenhouse gas emissions reduction. If we agree causality that greenhouse gas emissions are the direct negative side "product" of fossil fuels combustion, then we must conclude, that only absolute decrease of greenhouse gas emissions can improve environment. Then the proper action should be replacement of fossil fuels with non-fossil ones or technological advance in fossil fuels energy generation that would enable same energy produced with less greenhouse gas emissions. We now may state that environmental policy goals and means are unduly determined and reaching real desired effect will be rather coincidence than the result of purposeful action.

Another contradiction within energy policy in Slovakia is the fact that one single legislative instrument (Act 276/2001 & its successor, 2012) combines support of RNE sources with thermal power plant support. So there is *an incomprehensible clash of green and brown policies* that is eventually paid by consumers, as both sources receive price/revenue guarantee by law. The government agency forces consumers to pay for production of greenhouse gas emissions totally 95 mil. euro and at the same time it forces consumer to pay 400 million euro for reducing emissions (both are yearly plan for 2015). Brown policy actually represents employment policy, as agency's desired end is to preserve 4000 jobs in local coal mine. We may conclude that this instrument is inappropriate, as reaching target in one goal means deterioration in other goal.

Let us consider „security of supply issue“. For any reason, if all sources of energy in current energy mix become scarce, their price will cause electricity market price to increase. This becomes then an incentive for entrepreneurs to employ new sources for electricity production and new market prices will be reached at marginal level of least efficient source. But in opposite situation, when market price indicates that these sources are more expensive than current energy mix sources, employing of such submarginal production by command (intervention) will cause misspending. It does not matter, whether the cost is covered by consumer directly or indirectly by taxes. We may reach to same conclusions with the issues of „innovation“ and „employment“. Any innovation or employment that comes from submarginal production represents misspending and unsustainable.

Unintended consequences to producers. As we observe data at figure 1, dominant source in Slovak energy mix is a nuclear power, reaching almost 60 % market share. Second is thermal conventional source that was just recently overtaken by hydro source. When examining development of market shares of thermal conventional and nuclear sources, we might see that they are almost perfect substitutional couple in terms of mutual gains/losses.

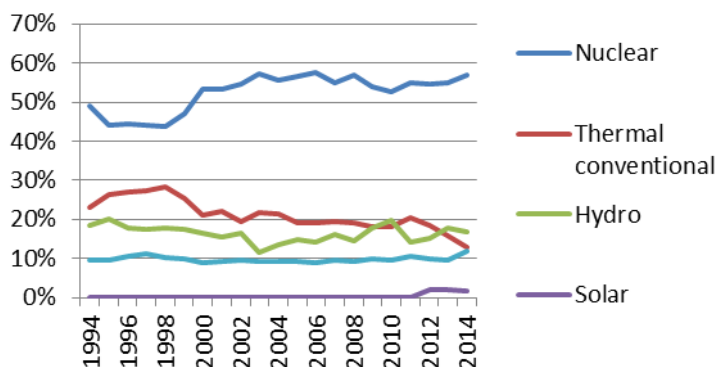


Figure 1 Slovak energy mix, share of sources on total production.

Source: Own elaboration, 2015. Data from SEPS a.s. annual reports 1994-2014.

Looking at contribution of main source of carbon dioxide, represented by thermal conventional source, this segment continually decreased production from its peak from 7336 MWh in 1998 to 3479 MWh in 2014. We may duly state, that this decrease is a long term phenomenon and latest RNE policy could only accelerate the process. Long term winner is though the nuclear segment, gaining the most in long term.

When we analyze the impact of EU green policy, firstly we must state, that policy has created massive new energy sources and redundancy of existing sources in Europe. Only in Slovak republic, the Ministry of Economy under NSRF 2007-2013 program „*Competitiveness and economic growth*“, priority axis 2, has provided subsidies in energy sector in amount of 131 million euro. Typical subsidy required 50 % co-financing, so total investment reached twice as much. This policy resulted in general price decrease as indicated above. Lower prices had negative effect on producers’ margins and their profitability decreased. Therefore capital goods valuation decreased or terminated (sources had made exit from the market).

Looking at recent shutdowns in Slovak production market (table 1), we may see least competitive sources that became submarginal due to the shrinking price, were thermal conventional plants using natural gas, followed plants combusting coal. Total switched off output was 1516 MW which represents almost 19 % of total installed output in 2014. Most importantly, all switched off sources were receiving no subsidies or guaranteed price, that demonstrates very high risk in investing in electricity production without backup of policy support. Ideal example is source PPC Malzenice with investment of 400 million euro and commercial production of only 2 years. This brand new power plant suffered from high natural gas prices and low electricity prices.

Table 1. Shutdowns of Electricity Production Sources in the Slovak Republic

Power plant	Source type	Installed output /MW/	Production stop /year/
EVO II. Vojany	natural gas	440	2006
PPC Malženice	natural gas	418	2013
PPC Bratislava	natural gas	218	2014
EVO I. Vojany /1,2/	Coal	220	2014
ENO B Novaky /3,4/	Coal	220	plan 2015

Source: SEPS a.s. and URSO annual reports. Own elaboration, 2015.

Unintended consequences to consumers. As we examined in our praxeological analysis, so far the intervention had negative impact on producers and had not solved negative externalities due to inappropriate means chosen by the government. Excess of production capacities had caused price and profitability decrease. Looking from perspective of consumer, decline in prices is “consumer positive”, but the price development has not been transformed into the Slovak retail prices. As we can see at figure 2, most of the „free market - competition efficiency gains” were terminated by other items of final price that are government regulated – by distribution costs, network services, other regulatory expenses and taxes, which are set up by Slovak regulatory agency (URSO). This agency has the legal power to regulate final prices for electricity supply to households and small companies and also regulates prices and fees for distribution and network services.

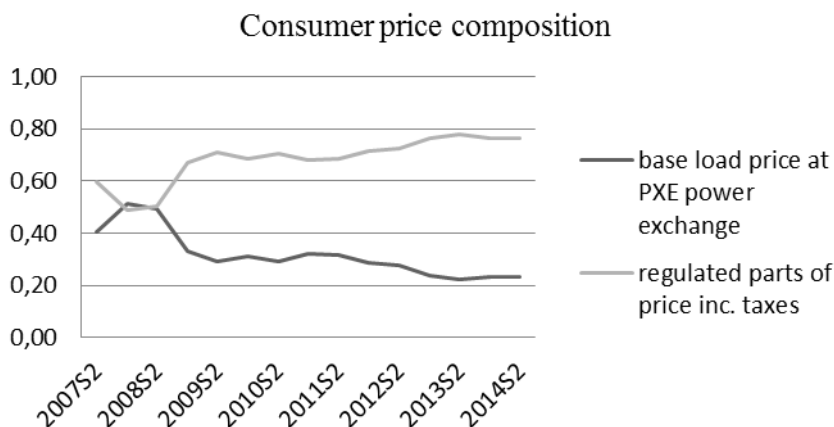


Figure 2 Consumer price composition in Slovakia.

Source: Own elaboration, 2015. Data from Eurostat and PXE power exchange 2007-2014.

When we break down regulated components of final consumer price, besides obvious taxes, distribution and network services costs, we can find also hidden fee called “tariff for system operation” (in further text we use Slovak abbreviation “TPS”). This fee guarantees by law certain purchase prices and in 2015 amount was 21,82 euro / MWh or 16,41 % of consumer price. Collection of TPS is formally similar to mechanism of a consumption tax, where taxpayer is electricity consumer (as each unit is levied by fixed amount). TPS is a so called “feed-in tariff” – implementation way of EU energy policy, where beneficiaries are 4 groups – renewable energy producers, combined producers of electricity and heat, thermal conventional producers of electricity from domestic coal and finally OKTE (organization of short term electricity market). The last item (OKTE) is rather a minor beneficiary (only 7 % in 2011). In absolute numbers, yearly volume of TPS that consumers are obliged to pay will reach 500 million euro in 2015 (estimation, as TPS is collected as advanced payment). This amount equals to almost 0,7 % of Slovak GDP and represents similar value that government spends on university education and primary research combined together. From consumers’ utility point of view TPS causes loss in welfare. As we explained earlier, intervention of government that intended to combat with negative externalities (environmental aspects) was unduly formulated and therefore was unable to compensate consumer losses with gains in form of reduction of greenhouse gases.

4. Conclusion

Our main focus in this article represented research question that examined what are the results of the government intervention in electricity market. We have reviewed reasoning of interventions (the intention) and came to conclusions that real societal problem is the environmental aspect of current EU/Slovak energy mix – fossil fuels combustion that produces greenhouse gas accountable for climate

changes. We have concluded that current policy of renewable energy sources support is unduly determined and does not guarantee reduction of greenhouse gases, even if the 20% goal is reached. We have proved that real consequences of this policy had led to excess of production facilities, declining prices of electricity, decreased profitability of all producers and exit from market of marginal production sources that are not subsidized.

Further unintended consequences that we have investigated were influencing consumers. We have demonstrated that lower market prices had not reached the bottom – the retail prices, as regulatory agency intervened with feed-in tariff (TPS) that accounts for 0,7 % GDP. This consumer welfare loss was not compensated with welfare profit of improving environmental parameters.

The only profiteers of the policy thus remain renewable energy source owners that received “15 years government guaranteed price decrees”, that eliminate risks of market changes and secures fulfillment of their business plan. The only risk of this political entrepreneurship is the change of the policy.

We may conclude our praxeological analysis with justification of Mises’s claim (1996) that intervention produces result contrary to its purpose and makes conditions worse, not better. The government failure leads to escalating price fixing and at the end it eliminates the market altogether. The consumers no longer direct production by their buying or not buying but the government does. The escalation may end up in planned economy or socialism as a substitution of the market economy. In case of Slovak / EU electricity market, unduly determined goals and means led to unintended consequences. Elimination of market mechanism caused submarginality of subsidy-free energy sources and increased need of providing subsidies to remaining energy mix sources.

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