

**ROLE OF RESIDENTIAL GAS PRICES IN THE
SUSTAINABILITY OF GAS MARKET REFORMS IN
UKRAINE**

By

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Abstract

Since the economic and territorial crisis broke out in 2014, Ukraine was pushed to edge of default. The rescue package from international donors arrived with strings attached. In my thesis I analyze the policy responses given within the new economic environment. My assumption is that the pro-Western change of orientation in Kiev is a critical juncture that allow for institutional change. Economic policies that contribute to the construction of inclusive economic institutions will shift the Ukrainian economy to a higher growth path. Legal harmonization of the Third Energy Package, restructuring of the Naftogaz and new monetary policy regime all contribute to it. Residential gas price liberalization is part of this process, although without a functioning targeted social support system, it will only contribute to the reversion of the process.

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Introduction

Ukraine and energy commodities has always had a special relationship. This is particularly true about natural gas. Impacts of the Soviet legacy of large infrastructure and cheap gas are still determinative. Gas industry has proven to be the honeypot for corruption and basis for state capture from regulatory point of view. However, this could only happen with Russia supplying the commodity on discounted prices. Throughout her history, Ukraine has been proclaimed to be in crossroads in matters of growth path and development. Most of these opportunities proved to be hasty assumptions. This thesis reasons that recent change of political orientation in Ukraine is a true critical juncture. As many times before, future depends on developments in gas industry.

From regulatory points of view, two contradictory processes have been taking shape in Europe. Competitive markets lie at one end of the scale, while the other end is occupied by monopolies. Member states of the European Union and Ukraine show similarities in the sense of market structures that characterized the beginning of the 1990s. Existence of natural monopolies were typical in network industries such as the telecommunications, natural gas or electricity sector. Competition (if any) was imperfect and restricted typically due to vertically integrated incumbent firms. Low levels of consumer welfare as well as policy developments in the European Union resulted in converging preferences of a single energy market. Interest groups of involved industries and policymakers have conflicting interests, therefore up until the middle of the 2000s, no efficient regulation emerged on the European level. For structuralist reasons, only exogenous shocks could bring about significant change. Most memorable of these were the supply security crises of 2006 and 2009 when taps on transit pipelines of Ukraine were shut off. As a result of these disruptions, supply-side measures were initiated on European level. The Third Energy Package was drafted, aiming to bring about competition on distribution and production segments of the supply chain.

Common regulations and the goal of creating a real, single European market for energy were adopted. The Energy Community was brought to life to increase the number of involved countries, including Ukraine too. The most important take away of the supply crises were the fact that industry interests can be overshadowed if there is a credible external threat. Consequently, lasting restructuring can be accomplished.

Stakes of restructuring the gas industry in Ukraine are higher. Since all presidents of the country have been involved in the gas business, it has proven to be the most sensitive and -resilient area to regulate. Corruption and mountains of debt are associated with the Naftogaz. The state-owned octopus' tentacles are intertwining the country's political and economic elites. Pro-Western reform efforts have been articulated before on oral level, but concrete evidences are hard to find. I will show in the second chapter that in the case of Ukraine, significant institutional change can only be reached if the Naftogaz is also subject to restructuring. It is a special opportunity for the country that the International Monetary Fund's program involves such elements. These demands of liberalization of the market are only the beginning of the mentioned process and are not likely to cause significant changes in the short term. However, this thesis claims that without the liberalization process, the proclaimed pro-Western orientation change in the politics will remain temporary.

In the following paragraphs I am outlining the important elements of my thesis' structure. The first chapter introduces the recent events in Ukraine, as well as the evolution of extractive institutions. In order to understand the forces that shaped economic and legal institutions of Ukraine, I am going to present challenges throughout the two decades of her independence. The unique geographical location of Kiev between the European Union and Russia turned the country's political orientation into a permanent domestic question. This resulted in the prevalence of such interest groups that captured the state and caused a continuous regional economic setback. I will

compare Ukraine's performance with Poland, a country of similar endowment in matters of recent history, economy and demography. Besides the comparison, I will detail the most important macroeconomic features of the analyzed country because I find it important to highlight the elements her fragile economy is exposed to the most. I am concluding the first chapter with setting the frame for the broader analysis.

H₁: The flee of Yanukovych created a critical juncture.

The emergence of extractive economic institutions during the transition captured the state as well as resulted in supplementary extractive political institutions. Changing these institutions have been sought before, although only in matters of words. My first *hypothesis* is that this is the first time in Ukraine's history when there is a real chance of bringing about institutional change. External pressure on the implementation of inclusive institutions play an important role in this.

In the second chapter, I am analyzing the natural gas sector of the country as well as its new regulatory framework. Gas has played a crucial role in Kiev's history, therefore it is a special and sensitive field for any restructuring initiative. In my analysis I will show that most economic and political actors of Ukraine are associated with the gas business. Therefore, only those endeavors can be successful that do not take into account these interests. The adoption of the new Law on Gas Markets reflects EU compatible legal framework for the restructuring. I will show the details through the introduction of the Third Energy Package. Among the expected results are increased competition in the segments of competition and distribution, as well as the decreasing financial exposure of the state-owned, vertically integrated mammoth company, the Naftogaz. Having been the attractive honeypot for corruption, unbundling activities from Naftogaz is expected to result in clash of interests.

H₂: Critical juncture can only result in institutional change if the gas industry is successfully restructured.

The introduction of unity cost to consumers converges industrial and residential prices. This is an important element in bringing the price setting closer to market dynamics. However, the households now face increased prices due to the removal of subsidies from the price. Bringing down these prices might occur from numerous sources and is crucial from the aspects of the acceptance of market-based reforms. Supply- and demand side measures are jointly present in concepts. I will argue that supply-side measures, such as the short term acceleration of domestic production, are not viable options for Ukraine. On the contrary, demand-side measures are expected to be more successful. I will use econometric models to test the elasticity of gas demand of households, arguing that previously typical overconsumption and energy waste can radically be reduced. Another aspect of price-driving forces is the exchange rate of the hryvnia. Considering the market price of the gas in Europe, recent years show a significant price fall, nearly halving it. However, the nominal import prices in Ukraine did not decrease, which is the consequence of the long depreciation of the hryvna. Currency appreciation is therefore the second approach to the possible easing of household gas prices.

H_{2.1}: Residential price liberalization is unsustainable without simultaneous introduction of targeted social support.

Within this section I will analyze the monetary and efficiency approach of bringing prices down. Residential gas prices have an essential role in the whole liberalization process as this is the first time of no government subsidies. Although the liberalization process is based on the elimination of these subsidies, the unsustainably high prices would trigger their reintroduction by the government. In order to avoid this, price reduction should be reached in the short term.

Literature Review

This section reviews the processed available literature on the central topics of my thesis. Firstly, I overview the literature on the change of Ukraine – Russian international relations. This is followed by the regulatory consequences of the gas-disputes, namely the goal of creating a single European energy market. I lay emphasis on the findings of competition policy as the European lessons are now appreciated in Ukraine. Outcomes of implementing regulations can never be taken granted. Authors of institutional and development economics underline this.

The conflict between Russia and Ukraine has lasting consequences of their relations, especially in the short term. Since 1991 when the Act of Declaration of Independence of Ukraine was adopted the country's dependence on her former occupying power went through major changes. Protests of Euromaidan and the flee of Yanukovych is understood from Moscow's point of view as an unconstitutional coup which "*changes the rules of the game*" (Allison, 2014, p. 1). This resulted in a reverse approach to the traditional economics and security of Ukraine, trying to find new opportunities outside of Russia (Menon & Rumer, 2015). They argue that Ukraine's crisis is a symptom of larger geopolitical trends that also require planning for a new security architecture for Europe. Researchers claim that previous conflicts that rose from gas disputes, could have been eased if they had been managed through multilateral agreements (Menkiszak, 2015). Circumstances and consequences of the conflicting countries are significant on all sides. Common European regulatory policies received a boost: gas crises of 2006 and 2009 resulted in structural changes in European energy regulation with high emphasis on the interconnectedness of EU members as well as on reverse flow capabilities (Pirani, Stern, & Yafimava, 2009; Stern, 2006). Regulations that aim for the creation of a single European energy market are grouped by the so called Third Energy Package (Official Journal of the European Union, 2009a, 2009b, 2009c, 2009d, 2009e). The Oxford

Institute for Energy Studies claim that the greatest achievement is the parallel success of archiving price reduction and price convergence between related countries (Yafimava, 2013). Criticizing the gap between the goals and reality, Kanellakis et al. (2013) state that deadlines are too softly met and therefore result in weak outcomes.

Ukraine committed herself by a Western orientation in 2014, which triggered a series of reforms that are associated with certain values. Development and institutional economics have wide range of literature on how countries can enter new phases of modernization or a step on a higher growth path. Values, development and modernization are all connected through political and economic institutions. The first definitive link between growth and institutions was created by the Noble laureate Ronald Coase in *The Problem of Social Cost* (1960) by emphasizing the enforcement of property rights. Acemoglu, an acclaimed expert in institutional economics claims that sustainable economic growth is only guaranteed through inclusive economic institutions e.g. secured property rights, law and order; general access to education; upheld contracts (2012). Although most institutions are designed by politically powerful elites that seek to extract resources from the rest of the society through extractive economic institutions. These are mainly paired with extractive political institutions that eliminate systems of checks and balances. Transition between exclusivity and inclusivity is possible but only when a nation arrives to a so called critical juncture. Although the opportunity is given, outcome is still uncertain during these times: „*The exact path of institutional development during these periods depends on which one of the opposing forces will succeed, which groups will be able to form effective coalitions, and which leaders will be able to structure events to their advantage*” (2012, p. 110). Institutional economics is outstanding in using institutional variables of nations long run macroeconomic performance (Easterly, 2005). Complexity of a positive change arise through the problem of the ‘iron law of oligarchy’, detailed by the sociologist Robert Michels (1966). Main statement is that any change where oligarchs can seize power will be challenged and inclusivity is less likely. In a study Belke et al. (2009) shows that uncertainty of the outcomes of the mentioned

changes can be influenced. Importance of external determinants of institutional change are emphasized, this has interesting conclusions for the case of Ukraine too. Pre-accession incentives by the NATO and EU increase while foreign aid decreases institutional development (only in the short run). In medium term foreign direct investment is crucial as it is mostly conditioned on the institutions on the institutional quality of the receiving country. Besides outside agents, domestic actors gain importance in the formation of economic policy that show “*commonalities with different dimensions of institutional reform*” (Di Tommaso, Raiser, & Weeks, 2007, p. 859). Consequently, economic policy can break path dependence through liberalization.

Efforts for institutional change occur within a deep restructuring process, with high emphasis on natural gas sector. Ownership rights and clashes of interests are in the spotlight now. But debate about ownership unbundling has a long history and can even be generalized to a competition-investment trade-off. The European Commission derives market malfunctions mainly from the existence of bundled, vertical integration claiming that they make wholesale markets illiquid, raise barriers to entry and likely to abuse their market power to reduce supply (European Commission, 2007). These findings are well supported with evidence in the cited inquiry. Vickers (1995) emphasizing that ownership unbundling decreases incentives of the network operator to make discrimination between the affiliated and independent production. Another pro argument (Joskow & Tirole, 2000) claims without unbundling incentives are given for market power to be exercised through withholding transmission capacity. Con argument is lined up by Newbery (2007) claiming that wholesale energy commodity markets create risks that are complementary for energy producers and suppliers, creating opportunity for risk hedging within company. He argues with the negatively correlated risk that exists when wholesale prices are high but suppliers are already contracted for a fixed price, therefore exposed to falling revenues. Mergers between generation and supply are risk-reducing and therefore synergistic strategy. The Commission’s inquiry and Newbery’s conclusions are not necessary oppose each other. While Newbery only analyzed competitive wholesale markets,

the Commission's findings are generalized to rather illiquid ones. Not being satisfied with the available quantitative research agenda on the evaluation of ownership unbundling effects, Growitsch and Stronzik (2009) carried out an in-depth econometric analysis, but could not find statistically significant effects of the unbundling. Only market opening proved to be significantly negatively correlated with the end-user price. Literature review on other aspects of the gas market liberalization can be found in Fraczek – Kaliski (2009).

Institutional Change

Recent Events

Spheres of influence overlap over Ukraine. The past two decades are characterized by the continuous struggle between committing either to pro-Western or to pro-Russian orientation. Being subject to regular reorientation, solid legal and economic institutional systems could not evolve to be durable against such challenges. Following the disintegration of the Soviet Union, new borders created serious divisions. Distribution of citizens with respect to ethnicity, religion or wealth was unequal, disguising possible conflicts in the future. Representation of such divisions can be found in the country's political leadership. Groups of elites interchangeably seized power relying always only on a partial of the country. In matters of orientation, pro-Russian (Kravchuk, Kuchma) and pro-Western (Yushchenko, Poroshenko) presidents led the country. The signatures of the Association Agreement in 2014 and of the Free Trade Agreement in 2016 symbolize the strongest commitment Ukraine has ever made towards any of the orientations (European Parliament, 2016). Restructuring the economy is one key issue within this commitment.

Exploitation of economic resources in Ukraine has always been subject to intensive internal and external forces. Corruption has a long tradition as well as state capture by the oligarchs. In order to understand the ongoing restructuring of the economy, the Ukrainian macroeconomic profile should be introduced within the thesis. Role of Russia in her neighbor's economic activity had always been strong, and consequently, always reflected the quality of the Ukrainian – Russian international relations. When conflicts of interest occurred, trade controls were often put in place through sanctions, embargoes or other restrictions. Therefore, economic ties were exposed to Moscow's political will. Well known economic tools such as sanctions, embargoes and restrictions were integral part of stakeholder agents' expectations.

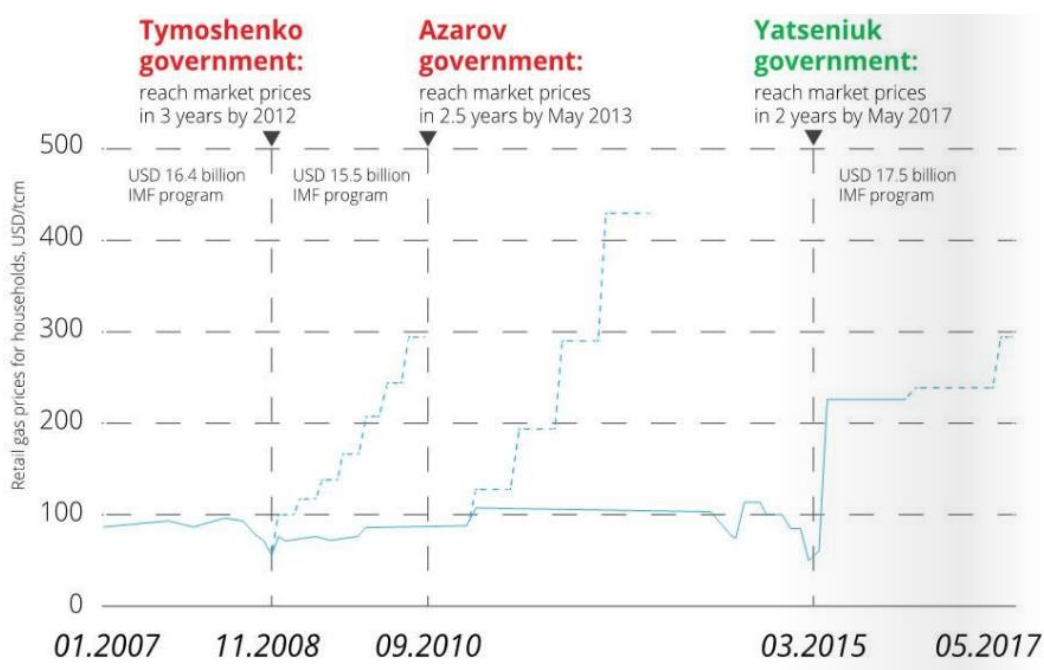
Conflict points of the Eastern states were the powder keg of the Ukrainian and Russian domestic political and economic forces. International relations bear the burden of the negative events that took place between the two countries. In the next subchapter, I set the theoretical framework of the mentioned conflict, by applying a theory from institutional economics.

Critical Juncture

According to Acemoglu's influential book (Acemoglu & Robinson, 2012) a critical juncture is a “*a major event or confluence of factors disrupting the existing economic or political balance in society, which [...] can open the way for breaking the cycle of extractive institutions and enable more inclusive ones to emerge which*” (2012, p. 101). This is a path dependent process, therefore initial conditions determine later outcomes in a causal way. Institutions that emerged throughout the history, can be generalized to four categories. Extractive economic institutions are the lack of law and order; insecure property rights; and regulations that prevent functioning of markets and create a non-level playing field. Extractive political institutions that concentrate power in the hands of a few, without respect to checks and balances or the rule of law. Inclusive economic institutions are incorporated in secured property rights, law and order, open to relatively free entry of new businesses and access to education and opportunity for the majority of citizens. The last category are the inclusive political institutions such as allowance of broad participation; pluralism and placing constraints and checks on politicians. The general question the authors ask is if inclusive institutions facilitate higher economic growth and more stability, then why are extractive ones so prevalent even today?

The change between inclusivity and exclusivity is rare and difficult. Changes create winners and losers. Latter risks losing their previous, conditional incomes for example monopolies while political losers might have to give up their privileged positions or the so called unconstrained

monopoly of power. Trade-offs are not always evident. Oligarchy may be more efficient in short run allocation of resources, but cannot give sustainable answer to dynamic challenges. Giving answers for challenges that occur in time of critical junctures can bring about institutional change. Chances for success are higher if these answer are given on democratic basis. Extractive institutions of Ukraine are well known both in the political and in the economic sphere. Ukraine had numerous critical junctures throughout her history. Independence from the Soviet Union, the Orange revolution, Yanukovych's no-signature and his flee from the country. In all these events, critical junctures manifested for which the society or the elite responded. In my understanding, the signing of the Association Treaty was the only answer that can be interpreted as a step towards inclusive institutions. Previously, extractive institutions were maintained as the elite could respond with the tools of repression or concessions with unchanged political institutions. The Figure below shows some interesting answer for critical junctures, mainly communicating reforms of inclusive economic institutions (driving out of subsidies), but offering concessions meanwhile.



1. Figure: Previous Plans to Increase Gas Price.
Source: (Naftogaz, 2015b, p. 36)

By responding with changing the criticized political institutions (turning away from Russia), the new Ukrainian leadership contracted for deep changes that also create winners and losers. The vicious circle of extractive institutions is based on the script that re-extraction is possible. The two most important commitment by new institutions in Ukraine is that there seem to be true will by restructuring of Naftogaz, ending its monopoly position. The complex subsidy system it incorporated allowed for reckless corruption. Equipped with new type of political capital after the critical juncture, politicians cannot rely on old economic relationships. These are more susceptible to shocks (e.g. civil outcry). This is supported by the notion that building clientele is more difficult and complex. Having drawn the conclusion from Acemoglu's theory, I consider my first hypothesis (H₁: The flee of Yanukovych created a critical juncture is) validated.

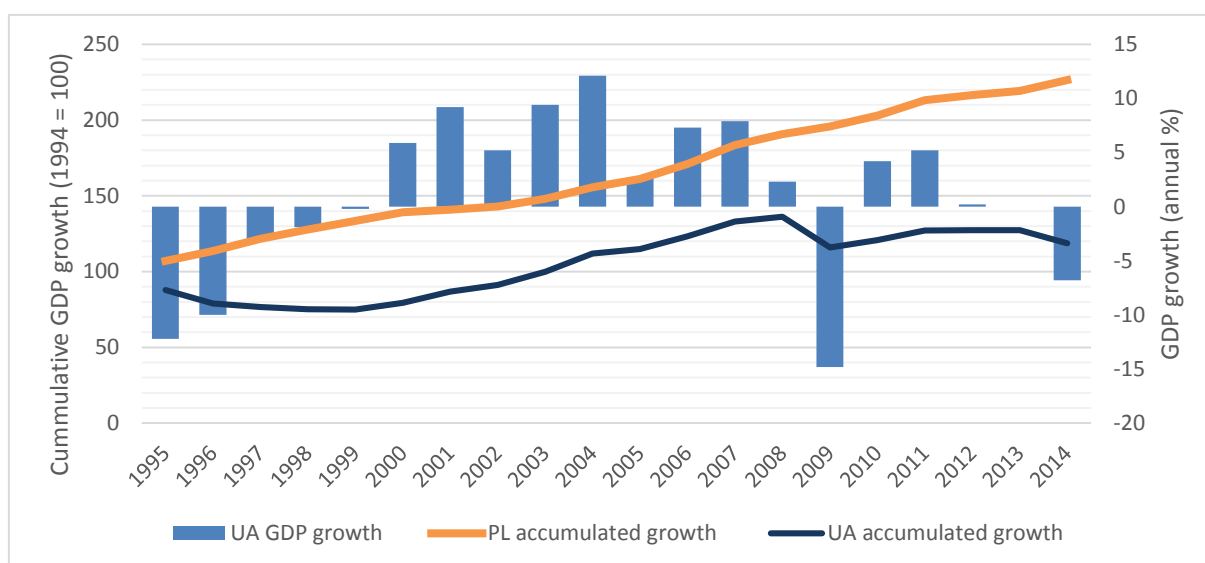
In matters of institutional theory, reforms in progress are positive steps towards institutional change. It is worth to be noted again, that the whole theory of institutional change is about path dependence. The basis of path dependence is reversibility as in the long run, little changes can be offset numerous times. I will show in a later section of the thesis, that on both political and economic way, the natural gas sector is the den of evil.

Economic Foundations

Macroeconomics of Ukraine

When the two countries' economic relations broke down, their national economies' were affected to a different extent. Level of dependence of Ukrainian economic sectors on their Russian counterparts differs, but they are generally high due to the decade long intertwining of the two economies. Energy industry is one of the most sensitive areas in this matter. State of the Ukrainian economy significantly changed in the post-2013 era. Hand in hand, volatility and recession became the most frequent features of the economy. In order to understand the economic effects of the new economic environment, I am providing a brief overview on the Ukrainian economy.

Symptoms of these permanent crises are well reflected in the economic output. Ukraine stepped on a road of steady fallback, starting from Polish-levels of economic development during transition, but continuously falling behind. While the growth rate of the GDP averaged at 1.135% between 1995 – 2014, annual percentages show huge differences. The boom period resulted in a maximum economic growth of 12.1% in 2004, but five years later the crisis brought about a recession of 14.8%. High levels of economic growth never returned to Ukraine, especially the downturn of the country that started in 2014. In the mentioned year, GDP decreased by 6% and the consecutive year show a decrease of 10%. (World Bank, 2016a). The decline in GDP per capita came to a halt in 2000 and started to increase. The change in the trend has demographic reasons too (see Figure 2). Figure 1 represents the accumulated growth Ukraine and Poland achieved since 1995. The difference is striking: started from similar basis, Poland tend to overgrow Ukraine every year. The difference results in a more than 100 percentage point difference. A later chapter on institutional differences gives explanation to this disparity. (World Bank, 2016b).

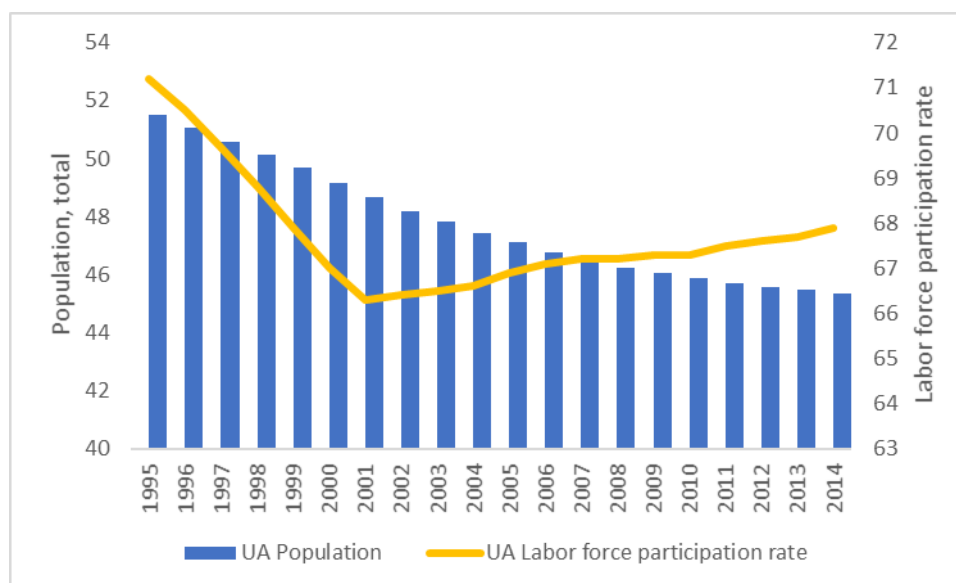


2. Figure: GDP growth of Ukraine and Poland.

Note: Aggregates are based on constant 2005 U.S. dollars, annual percentage growth rate of GDP (right Y-axis), accumulated growth (left Y-axis). Source: edited and (World Bank, 2016b)

Negative demographic trends pose massive risk for Ukraine's future. The United Nations Population Fund draws attention on the extremely low fertility rate and ageing population. Supplemented with high mortality rates and poor health, Ukraine seems to carry a demographic time bomb (United Nations Population Fund, 2015). Demographic tendencies show a sharp decline in population since the transition. Ukraine had a population above 52 million citizens in 1993, by 2014 this number dropped to 45 million. Rate of population decline decreased over time, almost reaching stagnation. Figure 2 shows an interesting trend in the population's labor force participation rate. Similarly to transition countries the participation rate radically decreased during the beginning of the 1990s, reaching historic low value of 66% in 2001. This year was a turning point as participation rate started to slightly increase year by year, reaching 68% of the population between ages 15 – 64. The year 2001 is the same date when the birth rate began to increase and with a few years lag, the ratio of elderly people above the age 65 started to decline. (World Bank, 2016b) However, this is no achievement to be optimistic about as demographic projections, based on numerous health care data are catastrophic. Projections of the continued decline range between

decrease to 40 to 15 million. Median projection is a population of 25 million citizens by 2050 (United Nations, 2015).



3. Figure: Demography and Labor Force.

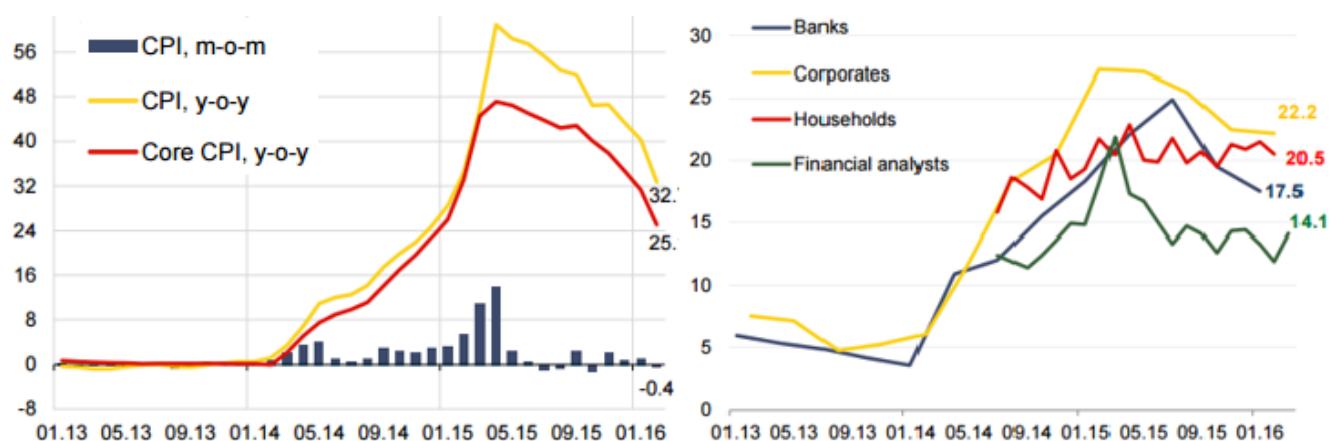
Note: Total population and labor force participation rate, percent of total population ages 15-64 (ILO estimate).

Source: (World Bank, 2016b)

Ukraine has seen unprecedented downturn in most of her macroeconomic indices. Nonetheless, throughout the year 2015 large imbalances have been reduced with respect to government deficits, recapitalization of banking sector and financial reserves. Stabilization is happening amid challenging international environment, due to export restrictions by Russia, drop in important commodity prices (steel, cereal). Decrease in commodity prices also put pressure on emerging market currencies, which have competitiveness-eroding consequences on the Ukrainian economy. According to the National Bank of Ukraine (NBU) estimates, even positive economic growth is possible in 2016 (National Bank of Ukraine, 2016b). Worsening terms of trade, Eastern sanctions and competitiveness all contribute to weak export and import data. NBU projects that only from 2017 will the trade activities contribute to the Gross Domestic Product positively.

Monetary Policy

The most powerfully striking and recurrent challenges to the Ukrainian economy was inflation. Figure below shows soaring, two-digit values of consumer price index. Financial crisis has numerous monetary effects, like the reduced demand for the national currency on the money markets. The USD - UAH exchange rate collapsed in 2014, pushing the rate from a stable 0.1214 to 0.0417 in 2016 (Bloomberg, 2016). Immediate consequences of the depreciation is the jump in dollar denominated import prices.



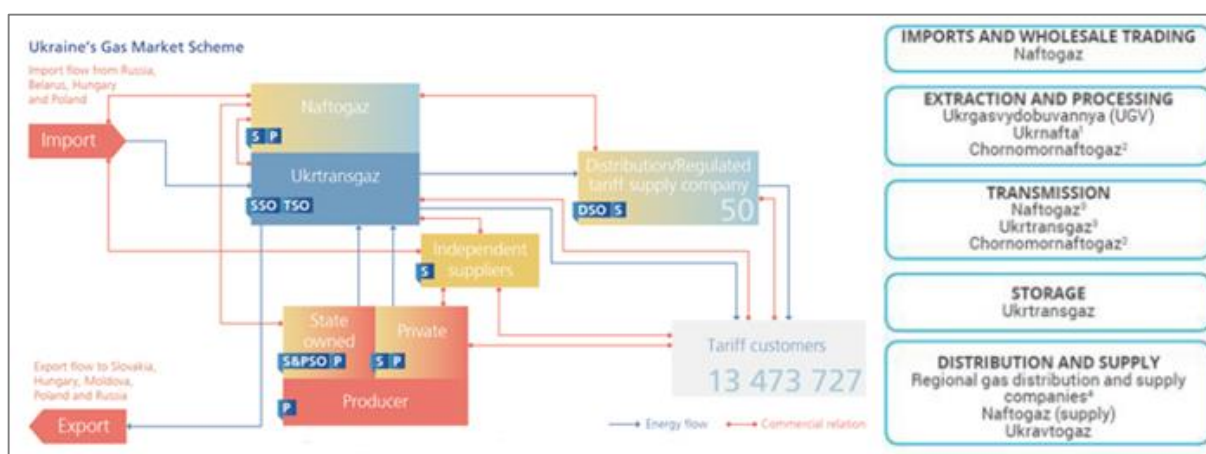
4. Figure: Inflation Indicators and Inflation Expectations.
Source: (National Bank of Ukraine, 2016b, p. 3)

The NBU committed itself by a medium term monetary strategy of implementing inflation targeting regime in order to achieve low and stable inflation. Main goals of the strategy are (i) priority of price stability, (ii) floating exchange rate regime, (iii) proactive decision-making, (iv) transparency of the NBU activities and (v) independence of the NBU. Naturally, price stability is the key objective to re-appreciate the purchasing power of the hryvna. This is sought by introducing a 12% target in 2016 and gradually reducing it to 5% by 2019. Conditions for such an achievement are stabilization of the financial system by dezinflation, growth of international reserves and stabilization of FX market. and economic growth supported by interest rate as operational target and further growth of international reserves. The NBU identifies the success of structural reforms

and privatization and the lack of further political instability as downward pressures on inflation. Supplemented with the successful following of the set monetary path, inflation could be maintained within one-digit values. On the opposite, commodity prices, the ‘Russian factor’ and corruption are seen as upward pressure features. (National Bank of Ukraine, 2016a)

Energy Profile

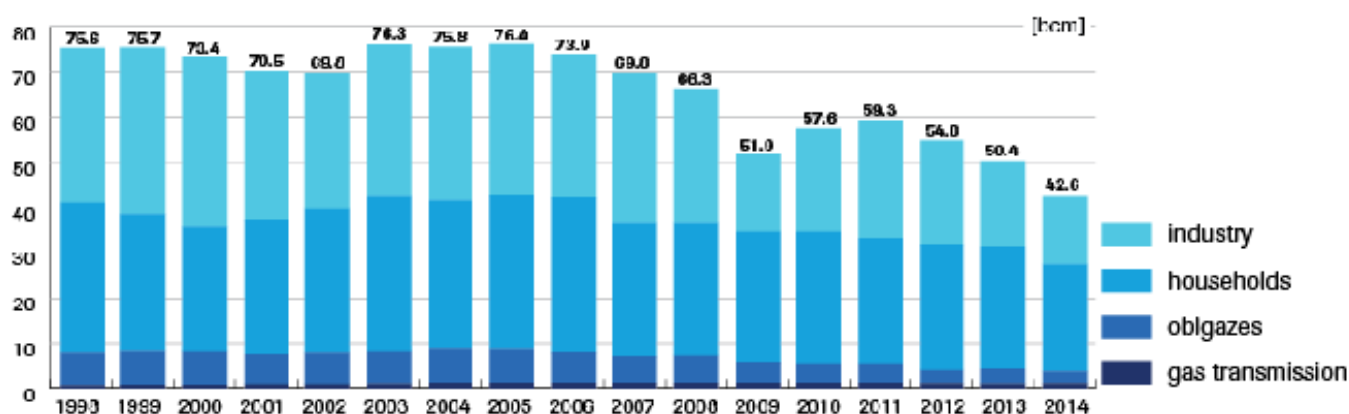
Similar to Ukraine’s international relations, her energy supply relations also went through major changes in the past years. Russian aggression triggered Naftogaz – Gazprom disagreements, sensitively affected domestic production on the one hand. On the other hand, intensified cooperation with European partners.



5. Figure: Gas Market Scheme of Ukraine.
Source: (Energy Community, 2015)

The Figure above represents a formalized network representation of Ukrainian gas industry. The vertical supply chain is depicted on the right side with indication of the stakeholder companies in the given segment. Naftogaz has ownership in all segments, major importer of foreign (European and Russian) gas. Gas flows are administered through the Ukrtransgaz, the transmission system operator. It is planned to be unbundled from Naftogaz, but still forms legal part of it. Energy cooperation with neighboring countries are contracted through the forms of interconnection agreements. The scheme shows that domestic consumption is partially covered by import and

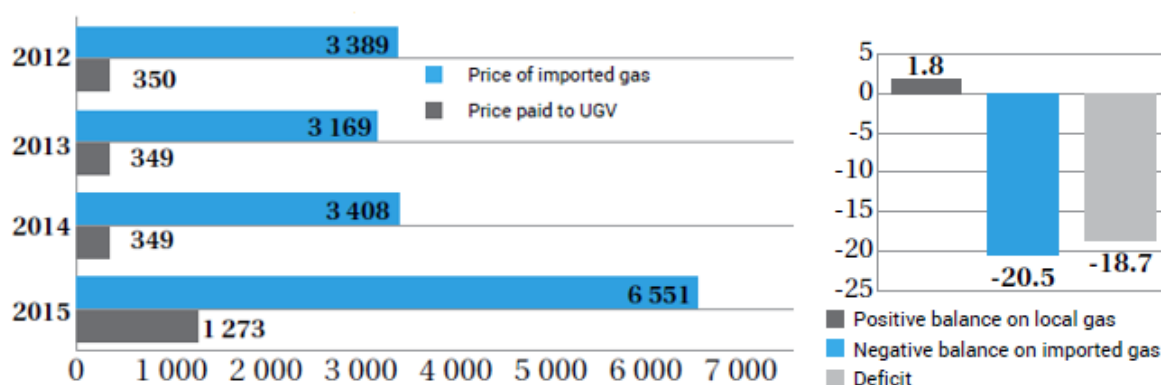
partially by domestic production. The two Naftogaz owned producer companies are the Ukgazvydobuvannya and the Ukrnafta that produce the majority of Ukrainian natural gas. Independent producers have a minor share of around 10% from that. Origins of import were 100% from Russia until the year of conflict, since when European firms also started exporting. There are two important changes that should be noted: (1) production is falling faster than consumption (2) growing import-need is satisfied from more export sources. In 2014 half of the inland consumption was covered by domestic production (20.5 bcm) and the other half by import (19.5 bcm) while 2.6 bcm gas was held in underground gas storages (Naftogaz, 2015a, p. 74).



6. Figure: Gas Demand and Imports in Ukraine.
 Note: Quantities are in billion cubic meters. Source: (Kononczuk, 2015)

Russian satisfied 100% of the import needs in 2012, but with the conflict escalating this portion started to decrease. In 2014 it dropped to 74% with numerous months when there was no Gazprom gas inflow at all (Naftogaz, 2015b, p. 79). As European import rose above 25% in 2014, the regional approach to security of supply paid off. Hungary, Poland and Slovakia established reverse flow capacities through their interconnectors, allowing for the export of West-European gas to Ukraine (sometimes the same Russian gas Ukraine denied to purchase from Gazprom). The Figure shows the overall market contraction. Industrial consumers decreased their consumption as a result of macroeconomic events. 2014 was the first year since 2004 when household consumption decreased

(from 16.2 to 14.9 bcm) (2015b, p. 74). According to the state-owned company's Annual Report, residential sector is the biggest lost-making business arm.



7. Figure: Average Purchase Prices Paid and Balance of Transactions.
 Note: VAT excluded, price is UAH/TCM; balance is in UAH billion. Source: (Naftogaz, 2015b, p. 77)

Naftogaz is the only supplier of households and sells most volumes under the weighted average cost of the purchasing. The cumulated gas demand of households in 2014 was around 22 bcm (15 for individual use and the rest for heating purposes). To cover that, Naftogaz imported 8.2 bcm on market price, as state-owned producers only transmitted 14 bcm gas on regulated prices. If summed in hryvna, these transactions go with 1.8 billion surpluses, while the import means 20.5 bn deficit. The overall balance is a deficit of 18.7 billion hryvnas. Main driving force behind the huge deficit of import gas is the foreign exchange risk it is exposed to through the dollar denomination. Locally produced cost-below gas is financed directly financed by the state, while the deficit the import gas causes is indirectly finances. At the end of the day deviations from market-pricing are paid by the government.

New Regulatory Framework

Road to the IMF Program

Qualitative analysis of the EU – Ukraine relation is not in the focus of this thesis. However, I do find it important to provide a brief overview of how the new framework of cooperation emerged, as well as how deeply its roots stretch. Legal harmonization and economic cooperation has its history between the European Union and Ukraine. The European Neighborhood Policy and the Eastern Partnership Program provided the framework for cooperation previously. When the contracting parties signed the Association Agreement in 2014, their international relations switched to a new gear. Economic integration and political association became the new basis. Political elements pave the way of the new partnership. Most importantly: freedom and security; deeper cooperation in sectors like energy, environment, financial services; rule of law; human rights; rural development; and civil society.

From economic point of view, the Agreement accelerated the creation of the Deep and Comprehensive Free Trade Agreement which is valid from 1 January, 2016. Export preferential was already given to Ukrainian products to offset Russian sanctions, but the free trade agreement lifts most of the remaining tariffs (Miller, 2015). Political and soft economic cooperation is important in the medium term, but not enough in case of the financial meltdown the country experiences since 2014. International actors (USA, EU, IMF, OSCE) put together a rescue package for Ukraine. The three key areas this sought to stabilize are (1) securing financial stability, (2) strengthening public finances and (3) advancing structural reforms. (International Monetary Fund, 2015, p. 1). I find it important to briefly overview the cornerstones of this cooperation, especially the commitments the Ukrainian government has to take in order to receive the installments of the

US\$17.5 billion package. I am going to sum the up in the following paragraph based on the official Stand-By-Agreement (SBA) of the IMF (International Monetary Fund, 2015).

Given close-to-collapse conditions in Ukraine, the IMF SBA program is really extensive, including (i) financing, (ii) macroeconomic framework, (iii) monetary and exchange rate policy, (iv) banking system soundness, (v) fiscal policy, (vi) energy policy and (vii) structural reforms. I am going to details the ones that are related to my hypotheses. More accurately, exchange rate policy, energy policy and structural reforms that are in relation to H_2 (Critical juncture can result in institutional change if the gas industry is successfully restructured) and $H_{2.1}$ (In the short term residential gas prices can only be decreased through energy efficiency investments). Policy details on gas pricing are matters of a later chapter.

Energy Policy section covers the details on the restructuring of the Naftogaz and introduces the end-user price hikes. The most overreaching goal is the healthy transformation of Naftogaz to reduce the public deficits it causes as well as to disconnect it from the political sphere and redirect its activities toward a more market-driven approach. In my understanding, the adoption of the new Law on Gas Markets, reflecting EU-harmonized policies, is of most importance. The policies can be generalized over the following four topics: (1) bring gas-pricing to cost-recovery level based on international gas prices by 2017; (2) restructure Naftogaz to reduce losses and public deficit as well as improve its corporate governance; (3) improve energy efficiency by raising acceptance of cost-recovery pricing and (4) raise investments in the sector.

Anti-corruption policy recommendations are mostly institution-based with high emphasis on new agencies such as the National Anti-Corruption Bureau. This is supported with new legal framework like the Anti-Money Laundering law. According to the table of Information on Commitments (p. 55) the Fund interprets the necessary legal changes in matters of anti-corruption as completed.

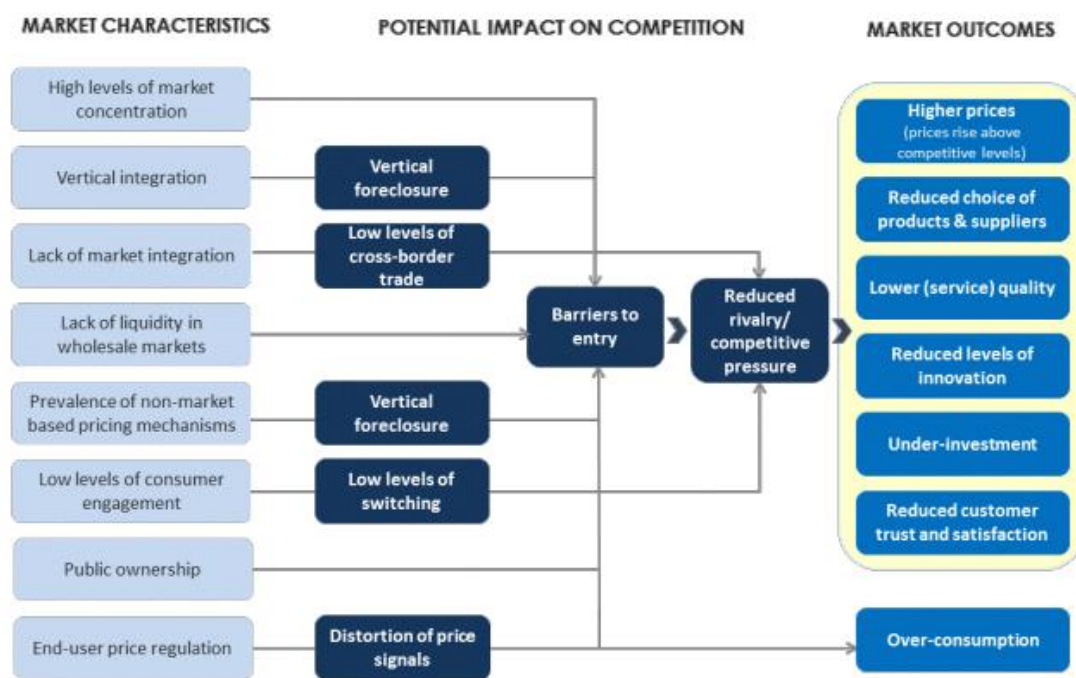
Connections between the anti-corruption measures and the restructuring of the Naftogaz are difficult to find in the Report. According to my paper's logic, they are rather inseparable.

The third policy recommendations that are in line with my recipe is the monetary and exchange rate policy. The International Monetary Fund acknowledges the urgent need for measures to contain inflation and lower the pressure on the hryvna. Already initiated tight monetary policy instruments are summed up, e.g. the National Bank of Ukraine's increase of main policy rate by 550 basis points to 19.5 percent (p. 17); further increase of rates on longer-maturity deposits; tighter capital controls. It is an important problem that inflationary pressures on the hryvna are not easing, therefore the forthcoming increase in the National Bank's international reserves is long awaited. Expectation from these disbursements are stabilization of exchange rate and normalization of the monetary environment (single digit inflation). The IMF takes note of the commitment that the NBU, while building up its reserves, will not sell them in the short term for monetary reasons (energy import and governmental needs are allowed). This approach is supplemented with maintaining flexible exchange rate regime and aiming for a posterior introduction of inflation targeting system.

The depths of implementing policy recommendations vary greatly. In case of anti-corruption measures, recommendations are limited to the creation of certain agencies. In other policy areas, such as the energy policy, details are much more important. Regulatory background of the gas market is harmonized with that of the European Union. Therefore, I find it important to present the original regulation, namely the third energy package. While providing an overview of it, the regulator's desirable outcomes will be revealed. This will allow for drawing conclusions on its Ukrainian implementation.

Regulation – European Side

Harmonized regulation of energy markets has received a boost since the 1990s, when the global political agenda directed the spotlight on environmental issues. The European Union soon became the pioneer of the issue, seeking synergies between economic growth and sustainability. Exogenous shocks were needed to bridge the gap between communication of strategic goals and action. The recession at the end of the 2000s and supply security distortions from the Russian supplier throughout the decade (gas crisis of 2006 and 2009) catalyzed the policymaking. Bottlenecks of an underperforming and dysfunctional internal energy market were revealed and identified. In order to take advantage of economies of scale, the 28 energy markets were to be reduced to a single one.



8. Figure: Relationship between market characteristics and market outcomes.

Source: European Commission, 2016, p. 70

The general need for multilateral regulation can be derived from economics. Natural monopolies dominated the network industries and built up the infrastructure for distribution for high fixed cost. Consequently, entry and exit is deterred as the network investments would be sunk cost.

Within this market structure the probability of monopoly power exploitation is high. Segmented markets are characterized by low consumer welfare and the lack of choosing supplier. Governments therefore aim to regulate these markets, aiming for the opening up of the infrastructure to bring competition. The regulatory goal is to prevent monopolies from pricing permanently over their long run marginal cost. Successful restructuring of these markets is expected to clear or decrease the distortions of the market such as below-cost pricing or overpricing.

The Figure shows distortive characteristics that were revealed during the 2006/2007 gas sector inquiry (European Commission, 2007). The conclusions lost some of their relevance by today, though they surprisingly reflect conditions dominant in the Ukrainian market. Main reasons for market malfunctioning are identified in low cross-border interconnection and public ownership. Lack of liquidity is another important reason, especially at wholesale level. Incumbent firms maintain their market share through below-cost pricing reducing incentives for other firms to enter the market or invest. Competitive forces are absent as consumers neither have nor seek the ability to choose between suppliers. Weak competition has significant impact on outcomes, such as barriers to entry, reduced competitive pressure and distortion of price signals. On the market outcome side are reduced levels of innovation, under-investment above-competition prices and often overconsumption.

The presented market structure lures for intervention. Such improvement should be based on the change in price-setting behavior, no longer by market power but rather increasingly driven by generation cost fundamentals, market liquidity or supply-demand dynamics. These are the fundamentals of the Third Energy Package. About the internal gas- and electricity markets it consists of three Regulations and two Directives, but can be summarized by the following pillars. Unbundling separates energy production from the operation of transmission networks through (i) ownership unbundling (OU), (ii) Independent Transmission Operator (ITO) and (iii) Independent

System Operator (ISO). The unbundled transmission system operators are grouped together to cooperate through the creation of the European Network of Transmission System Operators for Gas (ENTSOG). Both authority and independence are strengthened of the national regulators. Moreover, the establishment of the Agency for the Cooperation of Energy Regulators (ACER) enhances their professional activities. Consumer protection is gaining importance as the opportunity to change supplier is now given as well as the transparency of retail energy supply is increased as well. Lastly, but most importantly, third party access to existing infrastructure to mitigate market power exploitation. (European Commission, 2016a)

Besides bringing stakeholder companies and regulators to a common platform, the Energy Community acts as mediator between the legal regulations of the Member States and Contracting Parties. Gradual implementation of the Third Energy Package is in the focus. The last report of the institution pessimistically takes note that *“the reality stands in stark contrast to a sophisticated and widely compliant legislative framework.”* and *“The lack of infrastructure and the dominance of one single supplier will prevent the development of liquid markets and make the region very vulnerable to threats to security of supply.”* (Energy Community, 2014, p. 12). Interests group have natural counter interests toward the implementation process, but in the case of Ukraine, exogenous circumstances allow for its acceleration.

Legislation process of legal harmonization is happening in an unprecedented rate on the Ukrainian side. However, disruptions in gas (transit) supply also affects EU countries. The European Commission put together a new regulation as part of the sustainable energy security package. Main goal is to facilitate the shift from country- to regional approach in matters of energy security. This includes deeper cooperation between Contracting Parties such as through the principle of solidarity. This aims for mutual supply assistance especially towards households if disruptions occur. The regional approach means grouping member states to groups of 4-5 countries and also

the inclusion of Energy Community members in planning processes. This gains significance in the coordination of where to build interconnectors with reverse flow capacities. Implicit goals of the regulation concerning Ukraine are implicit. Kiev's risks of gas disruptions with Moscow can be mitigated through the energy security regulation. By involving Energy Community members in supply security scenarios, Ukraine is less exposed to the Gazprom's arbitrary compliance with the laws or "*suppliers from non-EU countries will have less room to exert pressure as a dominant seller*"(2016b, p. 6). (European Commission, 2016b)

Regulation – Ukrainian Side

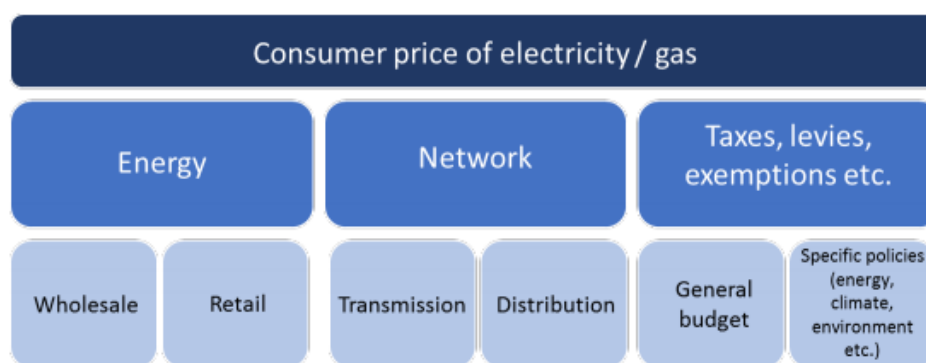
Throughout the negotiations with international institutions, the Ukrainian government committed by the restructuring of the natural gas system. Framework is set by the adoption of the 3rd Energy Package compliant Gas Market Law and is applied since 1 October 2015 (Naftogaz, 2015a). New principles are established to administer gas markets. Role and authority of regulator is strengthened, increasing supervision and legal power of the National Commission for State Energy and Public Utilities Regulation. Production and transmission activities are unbundled from Naftogaz through the Law, providing two options: ownership (OU) unbundling and independent system operator (ISO) (Independent System Operator is not listed). Difference between the two models is the effectiveness of separation (complete or legal). Choice between the two models is expected in 2016, but until the time of writing no final decision has been made. According to the director of Naftogaz business development, contract transition problems arose around Naftogaz – Gazprom deals that could not be transferred to Ukrtransgaz, delaying completion of unbundling (ICIS, 2016). Legal or effective separation must also be forced on distributional system operator (DSO) and gas storage facilities (GSF) too. This is important as Ukrainian DSOs also perform supply functions (small companies with less than 100.000. These reforms of the market allow for the implementation of the non-discriminatory access to gas transportation infrastructure. Article 11 is a notable section as

it describes the details on Public Service Obligations (PSO) that can be imposed on any gas market players. Considering the regular conflicts Ukraine is involved in, this is at least creating some legal basis for state intervention for ‘public interest objectives’. The gas pricing section seeks to put an end to cross-subsidization and non-cost reflective prices, but upholds the possibility of PSOs.

Putting an end to Naftogaz monopoly position is an important regulatory step. On one hand, Naftogaz-generated high government deficit can be lowered. Secondly, restructuring shall put an end to the massively extractive activities the company’s executives pursued. As a consequence of the fact that non-business principles governed the company for decades, Ukraine has become the least energy intensive country in the region (Enerdata, 2016). Strong ties with ministries and permanent legal disputes with the main supplier created an atmosphere of irresponsible behavior. Anti-monopoly law, restructuring and gradually introducing market-based pricing are all important steps in recognizing the specialty of the company in the country’s future. I could not verify or falsify my second hypothesis (H₂: Critical juncture can only result in institutional change if the gas industry is successfully restructured). Important decisions have been made about the Naftogaz, but the process is nowhere over. What is more, the whole restructuring is taking shape under exogenous pressure. This underlines the uncertainty about the successful finishing of restructuring.

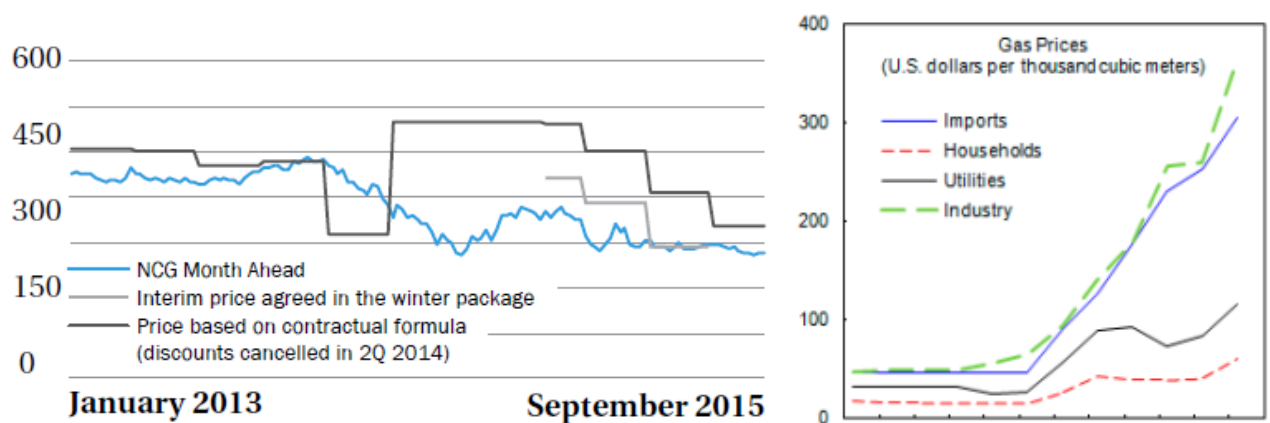
Gas Price Composition

The Figure below shows the general composition of energy commodity prices. When pricing the energy unit on the wholesale markets, prices either reflect an (oil-indexed) formula or gas-on-gas competition. The latter is based on supply and demand dynamics. This approaching characterizes more liquid markets, generally in Western-Europe.



9. Figure: Components of Gas Prices.
Source: (European Commission, 2016c, p. 61)

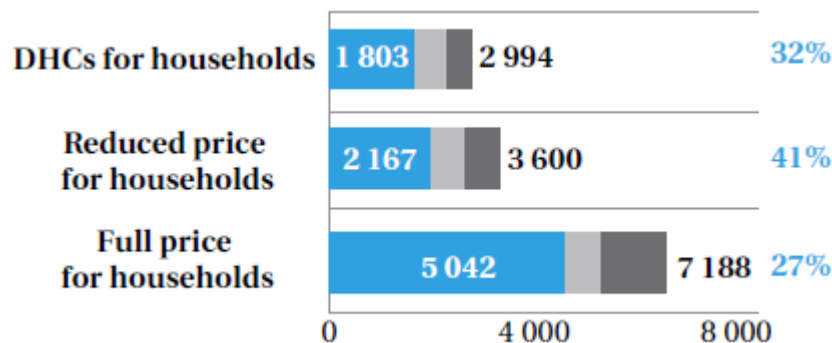
The difference between the spot prices and long-term contract pricing can be seen on the Figure below. Spot prices tend to be lower and less exposed to negotiations, while contract prices are often subject to the current negotiations between the contracting parties. As the import composition of Ukraine is changing, so is the risks the gas prices is exposed to. Previously, regular negotiations with the Gazprom resulted in the increase or decrease of the price. Now that the quarter of the import is from European exporters, this exposure has been reduced. However, as the Western gas is dollar nominated, new risks emerged: foreign exchange exposures. Although global trends show a general decrease in the mentioned commodity's price, it cannot be felt by the Ukrainian importers. Soaring inflation has a serious upward pressure on the nominal import price.



10. Figure: Gas Prices in Europe and within Ukraine

Note: Contractual formula for Naftogaz, measured in USD/TCM. Source: (Mitra & Atoyan, 2012, p. 6; Naftogaz, 2015b, p. 63)

Retail price is subsidized within Ukraine. The Figure above shows the numerous prices that are charged for the same energy unit. Industrial consumers are dominantly charged prices on market basis, but households pay a cross-subsidized price that does not reflect cost-recovery pricing at all. Price that end-users pay is split between (1) transportation, distributional and supply companies on the one hand (2) the state budget and (3) Naftogaz. Elimination of subsidies is a major goal of the current reform process. Expectation from it are (i) reduced overconsumption, (ii) decrease in Naftogaz deficits and (iii) less import demand. The new Law on the Natural Gas Market aims to eliminate residential subsidies by 2017 (Naftogaz, 2015a). First steps of subsidy-elimination have already increased prices. Differences decrease from being multifold to twofold.



11. Figure: Price Received by Naftogaz and post-tax Total Price.

Note: Starting from Q2 2015. Source: (Naftogaz, 2015b, p. 39)

It is important to take note of the households' expenses as they bear the costs at the end of the day. In the ranking of GDP PPP per capita, Ukraine has the lowest values in the region with 8260\$. Financial background for the average Ukrainian worker can be better understood through the average real wage. Currently the average monthly wage in Ukraine is 4895 UAH, or around 200\$ (Ukrstat, 2016). If the gas price increases with almost 1500 UAH, then the disposable income halves (in case of same level of consumption). Increasing costs of utilities are difficult to bear for households, especially without a well-designed support system. This gradual process will multiply end-user prices, therefore needs to be treated as a sensitive social issue. If tackled, gas market liberalization can be continued. For the time of writing, no clear support scheme has been adopted, pushing the results in risk. My sub-hypothesis (***Residential price liberalization is unsustainable without simultaneous introduction of targeted social support***) cannot be verified.

Policy Recommendation

Uncertainty around the stabilization of Ukrainian economy is high. It has so many exposures that it is challenging to offer lasting economic policies, even in the short run. Escalation of the political crisis in the East would call for an immediate reallocation of economic resources, rendering current priorities insignificant. Should the fragile majority evaporate from the reformists in the Parliament, present economic policies would be useless? If global price of commodities keeps falling, terms of trade will continue worsening. Nonetheless, in order to provide policy recommendation as added value, one should not consider extreme risks within value at risk. Through the lens of institutional economic theory, I managed to identify a few key areas which should receive more focus from the policymakers. These are the processes and variables that significantly contribute to institutional change and consequently to the building of inclusive institutions.

Efforts towards a more stable and credible monetary policy are welcomed. The shift to a floating exchange rate regime with the aim of implementing inflation targeting policy follows the examples of the majority of modern central banks. However, commitments by the future non-intervention on the money markets to stabilize the hryvna might be too early. Rate of depreciation was put to a halt, but taking stabilization for granted might be too early. While building up international reserves, a *vis maior* possibility of intervention should be reserved. Currency appreciation would ease import prices as well as soaring inflation too. The general approach of volatility minimization and one-digit inflation targeting is healthy.

Major developments of gas supply security have not been followed by policies. Structure of the import changed and European partners are increasing their shares. Average weighted price of this gas is lower than the Russian, while reliability of supply significantly higher, therefore should receive

priority. Besides the Hungarian, Polish and Slovak agreements, one should be contracted with the Romanian transmission system operator too. Restructuring of the Naftogaz is correctly identified as priority by the government as the IMF as well. Legal harmonization with the Third Energy Package went smoothly, but to create a competitive gas industry, there is still much to be done. No lasting solutions has been found on the unbundling model of the production and transmission entities of the company. The OU (Ownership Unbundling) model is dominant in Europe and would suit Ukraine as well. Effective separation of production and transmission would take away future incentives too from abusing market power. Corruption activities has typically concentrated around Naftogaz segments. The aimed market-based solutions and -environment are essential to bring about inclusive economic institutions.

Sustainability of gas market reforms are exposed to industry interest groups, therefore challenging to complete. The biggest challenge to tackle is the upward pressure on residential gas prices. The continuous reduction of subsidies results in higher prices. First installment of increase almost halved the disposable income of the lowest social group. In order to mitigate the risk of impoverishment, demand side measures are required in the gas industry. A well designed energy efficiency support system is a sustainable solution in the medium turn.

Conclusions

Visions about Ukraine's future are always related to energy policy. Pessimist scenarios see Kiev import-dependent and exposed to Russian supply insecurity. Optimists, on the other hand, see her energy-independent with high levels of domestic production. Either way, the country's performance intertwined with her energy relations. Two years ago guesswork began another time, Ukraine is at crossroads again. Since the start of Russian – Ukrainian conflict, Kiev experienced an economic downturn, like never before. Main macroeconomic indicators were in a free fall for a year and the economy came close to default. Financial aid from the IMF and European partners rescued her from defaulting, but strings were attached. These strings are the exogenous pressure that was long awaited to carry out structural reforms.

The International Monetary Fund has policy and legislation recommendation for most public policy areas, aiming to implement worldwide best practices in the crisis-torn economy. I analyzed the state of economy from a different, less holistic perspective. Theoretical foundations of my thesis are based on Acemoglu's institutional theory of institutional changes. His findings about the relation between macroeconomic indicators and institutions on country performance have relevance for Ukraine too. Extractive political institutions restrict political rights, introduce uncertainty to the rule of law and maintain the privileges of the elite. Extractive economic institutions tend to allocate resources rapidly and generate channels through which elites can seek rents and provide resources for their environment. But fail to adopt to dynamic challenges due to preference for the incumbent firms. These institutions are in the interest of a minor group with power, whereas inclusive institutions are rather associated with economic growth and stability. Changing the dominant institutions is possible, but never easy. According to Acemoglu, nations have the opportunity to step on a different growth path when they encounter a critical juncture.

Due to path dependence, the consecutive acts will be determinative for the future. The Russian orientation of the country was again and again strengthened through political compromises that the Ukrainian elite received, mainly through the gas industry. The signing of the Association Treaty with the EU was the latest critical juncture, which was followed by credible promises of institutional change (and not repression). The IMF and the EU supported the fabrication of the reform agenda, which provides the skeleton of the mentioned change. Restructuring of the gas market is in the center of the process.

Naftogaz was in the center of the vicious circle that allowed for the repetition of resource extraction and maintaining of corrupt relations and ties. Introduction of anti-monopoly law, adoption of the third energy package with its non-discriminatory access are good basis for credible change. Turning the state mammoth into a market-driven organization can set forth inclusive economic institutions. However, market-based approach also includes the gradual elimination of gas price subsidies. Consequently, residential prices face an upward pressure both because of the subsidy reduction and because of the depreciation of the hryvna. Due to low real wages, without functioning targeted social support, social distress is expected. Energy efficiency investments and stabilization of the national currency can bring about the reduction in real prices. Although this is not to be expected in the short run.

The legal harmonization process is intensive, Ukraine performs outstandingly within the Energy Community. Not only the physical infrastructure exists with the neighbors, but reverse flows are contributing to more than a quarter of the overall gas import of the country. In the past two years, prices tended to be lower than the ones offered by Gazprom. Nonetheless, not importing from Russia is an unsustainable status. Long term contract with the Gazprom has political dimensions too, but the alternative (European import) has exchange rate risks. In an uncertain and politically risky environment like the present one, gas supply should stand on more legs. Another expected

aspect of price increase is the reduction on excess consumption. It is not unrealistic to expect lower consumption rates as the energy efficiency is the lowest here in the region. The principle of consumer protection is based on conscious consumers. Important conclusion of my thesis is that the process of building inclusive institutions under exogenous pressure is possible, but sustainability strongly depends on the sensitive social groups.

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