IV. SANCTIONS AGAINST IRAN – A PRELIMINARY ECONOMIC ASSESSMENT

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Introduction

This chapter seeks to contribute to the academic and policy debates on the merits of sanctions against Iran by providing an empirical analysis of their economic impact.[1] It starts by taking a look at stylised facts[2] in order to establish whether sanctions are effective – measured by the degree to which they have constrained the Iranian authorities' ability to sustain their ambitions in the nuclear field as a result of the costs sanctions have inflicted on the country. Having established the conditions under which sanctions meet the criteria for success (as developed in chapter I), the rest of the chapter explores the results of an econometric model that not only tracks the economic mechanisms through which sanctions operate, but also analyses their spillover effects in the political realm.

The Iranian case meets the economic requirements for success

The Iranian case would *a priori* seem to meet the underlying conditions under which sanctions should have a significant economic impact. Among them we can identify a sufficient level of pre-sanctions trade linkage between senders and the target country, combined with limited capabilities to substitute import and export products, as well as an unexpected broadening of the sanctions imposed and the use of a new tactic, namely the exclusion of Iran from the SWIFT worldwide messaging system.

Trade sanctions

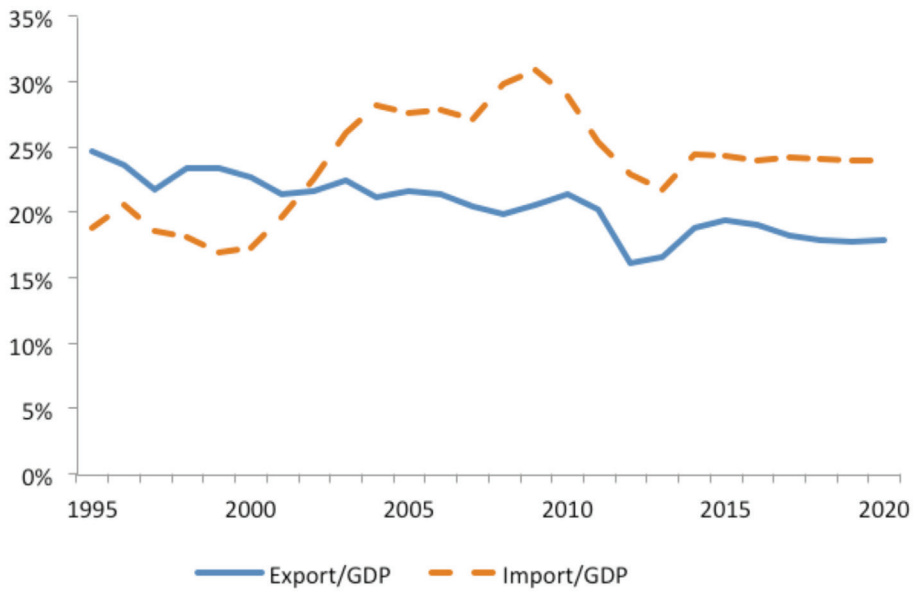
One of the most robust pre-conditions determining the degree to which sanctions have a significant economic impact is through the levels of pre-sanctions trade linkages. Figure 1 primarily shows that there was a significant level of pre-sanctions trade openness. Moreover, trade between Iran, the EU and the US covered some

1. Editor's note: This analysis is an *ex ante* assessment of the effects of sanctions on Iran and the likelihood of their success. It is based on economic modelling. The analysis, building and expanding on a paper co-authored with Sajjad Dizaji (2013), was undertaken before the July 2015 agreement between the E3+3 powers and Iran on the country's nuclear programme. At the time of writing of this report in July 2015, it turns out that this model has proven highly predictive. The analysis offered in this chapter offers powerful insights into the dynamics of sanctions.

2. This term, originally devised by the economist Nicholas Kaldor, refers to broad insights and deductions derived from empirical analysis of the behaviour of a set of economic variables.

18% of Iran's total export earnings. Between 2011 and 2013 (the 2013 numbers still being estimates), both trade ratios decreased by about four percentage points or a 14-18 % decrease. This is in line with Iran's 2010/11 export-to-GDP ratio of 21% and the share of the EU and US in Iran's exports of 18% (these ratios in combination imply that trade at risk is 3.8% of Iran's GDP). Figure 1 also shows the substantial decrease in Iranian overall trade, pointing to the possibility that sanctions may have contributed to this trade contraction. Given that exports are dominated by oil and that this specific product cannot be used as substitute for the import of capital goods, commodities and food, the effects of the imposed oil embargo are exacerbated. The reduction in oil export revenue as a result of the oil embargo spills over, first to the government budget and next to private consumption and investment.

Figure 1: Trade to GNP ratios for Iran (1995-2012 and estimates and forecasts for 2013-2020)



Sources for data: GDP, exports and imports at constant 2000 prices and dollars for 1995-2007 are from World Bank, World DataBank, http://databank.worldbank.org (accessed December 2012) and calculated from their real growth rates for 2008-13 as reported and estimated in IMF, April 2015 World Economic Outlook database (accessed May 2015)

Financial sanctions

The EU and US financial sanctions that accompanied the oil boycott may explain why the sanctions are biting much harder than expected – on the basis of pre-sanctions trade patterns. One of the measures taken within the EU's financial sanctions package was to exclude Iran from the SWIFT worldwide messaging system, which is used to arrange international money transfers. This makes it significantly harder to process international payments, while simultaneously constraining other bilateral economic flows. Most importantly, the financial sanctions imposed are characterised by their unexpected scale (concretely through the involvement of the EU); while Iran's exclusion from SWIFT is a measure that was used for the first time in history, and thus represents a new and innovative step.

Economic dimension: key findings

- Pre-sanction trade linkage was substantial.
- Substitution possibilities between exported and imported products remain limited.
- Scale of the trade and investment sanctions was unexpected.
- SWIFT sanctions were unexpected.

These four key findings do *not* imply that the sanctions regime will succeed in achieving its stated goal – but rather that the expected likelihood of sanctions having a significant economic impact is rather high.

The political economy of sanctions

While the economic analysis suggests that sanctions are likely to have an important economic impact, we need to dig deeper into the knock-on effects brought about by restrictive measures from a political economy perspective.

Sanctions goals

First, it is important to note that the formally stated goal of the sanctions regime against Iran is to halt its nuclear programme, due to the suspicion that it is not being developed for peaceful purposes. As a result, it is important to check if the existing cases of sanctions regimes to enforce non-proliferation are statistically different from other sanctions regimes in general. After all, if it is more difficult to enforce non-proliferation, then we need to discount this in our assessment of the likelihood

that sanctions will succeed in constraining or prompting a behavioural change on the part of the target.

The Peterson dataset lists 21 sanctions regimes that aim to change nuclear policies. Six cases are successful (28%): it should be noted that the median duration for successes and failures are 1-4 years, respectively. Additional testing with a probability model that takes into account controlling factors such as trade linkage, duration, political stability and sender reputation, does not find a statistically significant difference for non-proliferation sanctions regimes [van Bergeijk, 2009]: the non-proliferation cases can thus be analysed as if they were general sanction episodes.

Many commentators have linked sanctions to democratisation and in the Iran case perhaps this is an even more important goal for some of the current sender countries. Indeed, sanctions also appear to have been implemented with the hope of facilitating a democratic breakthrough in the target country. The implication is that the non-proliferation cases can be analysed and sanctions episodes aimed at strengthening democracy. This is yet another reason to focus our discussion below on the political changes in Iran.

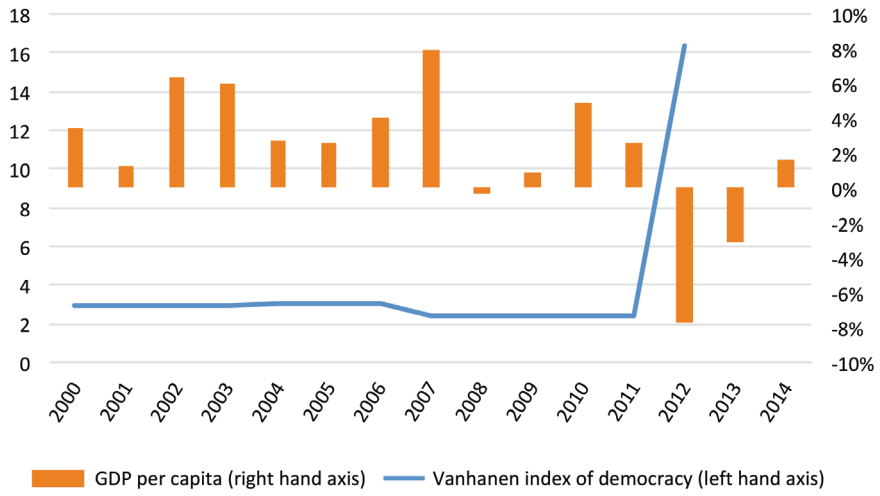
Interest groups and regime change

The second issue to be noted is that we need to qualify the implicit assumption of a rational unitary actor – one that makes a cost-benefit analysis for society as a whole and acts accordingly. This is rather simplistic. The 'public choice' approach to economic sanctions in which interest group competition and political institutions are an important determinant of the impact of sanctions focuses attention on the extent to which sanctions hurt the supporters of the target government directly or compromise that government's ability to reward supporters or, alternatively, suppress opposition. A body of empirical research shows a direct link between oil revenue and government expenditure, especially regarding military spending.

The strength of the economy has been associated with the likelihood that the target's leadership will survive. Typically growth slowdowns are associated with higher political turnover. Sanctions may either help to replace the target country's government or open up a bargaining range, making the target country's leadership more willing to compromise due to the increasing political costs of not complying (i.e. a higher likelihood of government turnover). The key point is that the variations in economic wealth resulting from the imposition of sanctions matters empirically.

Figure 2 takes a closer look at the evolution of this sanctions effect, bringing the growth and decline of GDP *per capita* as well as an index for democratisation into one picture. The simultaneous reduction of *per capita* income and the extent of democracy are remarkable, even if the causal relation could be deemed tentative at best.

Figure 2: Development of GDP per capita (growth rate) and Vanhanen index of democracy



Sources for data: IMF World Economic Outlook database (April 2015) and Tatu Vanhanen, *Measures of Democracy* 1810-2012 [computer file]. FSD1289, version 6.0 (2014-01-31). Tatu Vanhanen & Krister Lundell, [data collection]. Tampere: Finnish Social Science Data Archive [distributor], 2014.

From this we can infer that sanctions have adversely affected the middle class. The imposed sanctions created hardship and may have been one of the important motivating forces behind the 2013 democratic change of leadership that brought Rouhani to power. In our discussion we fortunately do not have to answer the question of whether the sanctions actually *caused* this shift. What matters is that sanctions have a better chance of succeeding in more democratic targets.

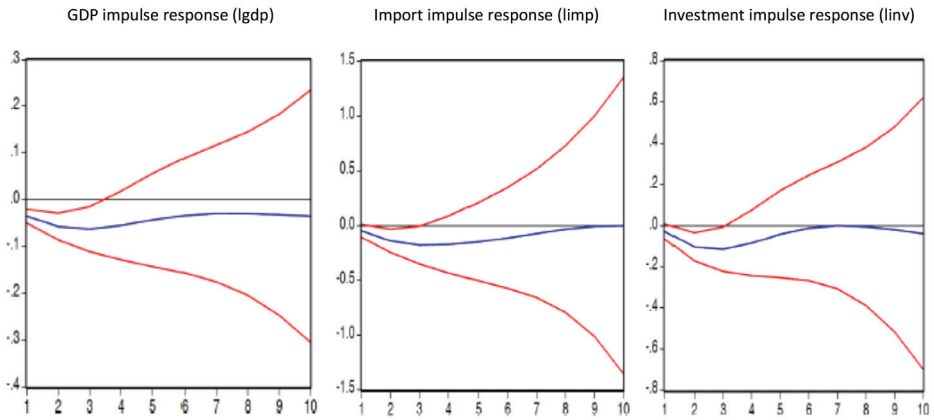
Political dimension: key findings

- The sanctions did not generate support for the existing regime (no rally around the flag effect).
- Very significant increase in democracy index.

Modelling economics and politics

In order to shed light on the causal mechanisms, a *Vector Auto Regressive* (VAR) model for Iran is used. A VAR model is based on the historical evolution of the data rather than on some preconceived theory and is able to capture the dynamics of an economy. Our model ably describes the history (1959-2006) of both key economic variables (oil and gas rents, government consumption, imports, gross capital formation, GDP) as well as political variables that either measure the autocracy-democracy dimension (the so-called Polity IV indicator) or the Vanhanen index, that measures political competition and participation. We estimate the VAR model on the basis of annual data for the period 1959-2006. In this model a shock is introduced in the economic system that mimics the sanctions and thus offers a prediction of sanction outcome.

Figure 3: Sanction impact on GDP, imports and investment in Iran



Source for data: Dizaji and van Bergeijk, 2013, *Generalized impulse responses - statistical appendix* appendix (internet resource available at : http://jpr.sagepub.com/content/50/6/721/suppl/DC1)

Economic variables

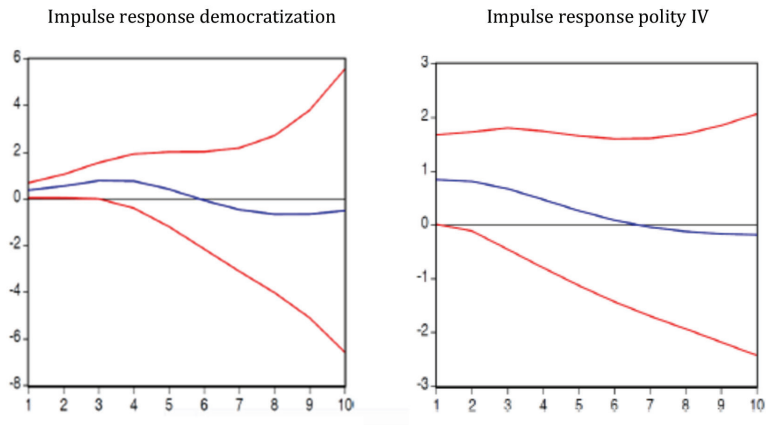
The blue lines represent the impulse response functions (first graph for GDP, second for imports and third for investment). The patterns of the economic impulse response functions are similar: a negative and initially large impact that becomes larger in size up to the third year after the sanction shock is administered and then becomes smaller as the economy adjusts.[3]

3. Note that the red lines report the confidence interval's upper and lower bounds; the negative impact is thus only significant in the first three years - that is, until the upper bound crosses the horizontal axis.

Political variables

Figure 4 reports the key findings for the variables of interest: the impact of sanctions on political outcomes in Iran. The left-hand panel in Figure 4 focuses on the impact of the sanctions on the extent of democratisation; a positive impact implies that the sanctions stimulate democracy. The right-hand side panel in Figure 4 reports on the Polity IV indicator that measures Iran's location on the democracy-autocracy continuum. An increase in these two measures is associated with more democratic (less autocratic) outcomes. The two approaches show similar results, thus giving us some confidence in the robustness of the findings: an initially significant positive shock that turns negative after six to seven years. While the shift towards more democracy is reflected by the 2013 elections, it is too early to tell if the model's prediction of a turnaround in 2017-18 is on track.

Figure 4: Sanction impact on index of democracy and polity-IV



Source for data: Dizaji and van Bergeijk, 2013, *Generalized impulse responses - statistical appendix* (internet resource available at http://jpr.sagepub.com/content/50/6/721/suppl/DC1)

Key findings

- The impact of an oil boycott on the Iranian economy is considerable: oil and gas rents are important drivers of key macroeconomic variables (GDP, imports and investments) and ultimately of its political system.
- A reduction of oil and gas rents creates economic costs that act as incentives to move towards a more democratic setting.
- In the first two years, sanctions have a significantly positive impact, but the VAR model predicts that this effect wanes and in the long run the political effect of sanctions is negative.

A final note on the phasing-out of sanctions

Adjustment of the economy does not only reduce the negative impact of sanctions. It also reduces the direct benefits of terminating the sanctions regime. This is a logical consequence emanating from a lowering of the economy's dependence on international trade (more autarky). While this does not influence the long-run free trade benefits, the fact that the economy needs to re-adjust implies costs that should be discounted properly. Again, the implication is that the sanctions can only help to soften the Iranian position in the short run. Long-term sanctions against Iran, in contrast, may run counter to the cost-inducing effects of the initial years of implementation.

Summary of key findings

- Theory and empirical evidence lead to the conclusion that the economic impact of sanctions on the Iranian economy is considerable.
- Sanctions create economic costs that act as incentives to move toward a more democratic system.
- This effect is only significant in the first two years and turns negative after 6-7 years due to economic adjustment.
- Increasing global pressure will initially cause effective damage pushing for more democracy or less autocracy and thereby leading to a softening of the Iranian negotiation position.
- In the long run, sanctions, however, are likely to have the opposite effect. In this sense sanctions have created a window of opportunity, but it is important to realise that this window is likely to close if the sanctions regime is prolonged.