

Natural Gas Supply Behavior under Interventionism: The Case of Argentina

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Executive Summary

The aim of this paper is to contribute to the scrutiny of the likely factors behind the sharp fall in natural gas supply observed in the last decade in Argentina, which is an interesting case of very bad performance under strong state intervention. Figure 1 represents the monthly evolution of aggregate natural gas production and domestic consumption from 2003 to 2013. The Figure shows that the fall in production has been matched by a corresponding increase in net imports in order to satisfy domestic demand. Thus supply and demand behaved in an unrelated manner during the sample period, both contributing at different stages to the widening gap covered by a drastic switch in the net export position, which translated in a strong negative external shock for the country. Demand did not show, on this basic accounting, an effect upon supply dynamics, except for demand shocks years with harsh winters or due a very short and

mild recession in 2009. Furthermore, the nationalization of the leading firm in the gas market (YPF) in early 2012 did not change the observed underlying dynamics.

Different arguments put forward by academic studies or policy debates have attempted to explain this phenomenon, depending on the role attributed to firm behavior on the one hand and the policy or regulatory environment on the other. The government or official view attached the culprit of the fall in production to the lack of investment efforts by large firms and in particular YPF (controlled by Repsol since 1999), which ended-up in an expropriation announcement in April 2012. Other views regarded the drop in production as the expected evolution of conventional natural gas resources beyond the impact of regulatory interventions. Others see a central responsibility in energy policy due to earlier the contractual disruption in natural gas markets created by an interventionist paradigm adopted since 2002. These explanations put different weights to investment efforts, lack of contractual renegotiation to extend concessions, a too permissive exports program in the late 90s, the under-performance of the major area (Loma de la Lata), departure from border prices embedded in imports from Bolivia and the like. However, these effects have not been tested in the received literature, and the empirical support for many claims relies on casual observation, descriptive statistics or partial relationships that do not control for other effects and therefore do not fit, in our view, into a credible methodological testing. This is the central motivation of this paper.

We start our research by using a basic theoretical framework that we claim should be the starting point from where to refer the empirical evaluation of the drop in production. We do so by using a simple supply model of a non renewable natural resource with a basic framework adapted from the literature that allow us to derive an optimal supply from a producer -that in our representation is constrained by regulated

prices- and is facing a depletion process (as reserves fall) that raises production costs (i.e. decreases productivity). We use one main representation – the fact that production should be seen as conditional on reserves or, equivalently, cumulative past production- as a guidance to specify our empirical research on a large data base constructed for this paper and used for the first time in an econometric assessment of natural gas production performance in Argentina. We account for the characteristics of our data set -a panel of the change in annual production of 168 areas of production between 2003 and 2013-, the specification of our econometric equation and the definition and sources of the main variables. Natural gas supply depends on past accumulated production (or alternatively on remaining reserves) that represents resource depletion and on a set of controls to capture basin and area heterogeneity, firm effects, investment efforts, extension of concession contracts, link to an export project and demand effects as a reaction to winter rationing of industrial customers and electricity generators.

The main result of this paper is that the drop in natural gas production experienced by Argentina can indeed be modeled from a basic standard theory approach, which is the natural setting to start exploring the significance of other often cited explanations attributed to firms, areas, renegotiation of concessions. The evidence shows that the observed downcycle conforms to the prediction of a simple model of depressed economic incentives acting upon mature conventional natural gas fields and hindering investment in reserve additions or new technologies. The role of past investment is considered in our framework and although it is endogenously determined it can nevertheless suggest a similar explanation. Our results are clear enough on the scant evidence in favor of firm-specific or area-specific effects that may suggest abnormal behavior and on the relative low power on production dynamics on renegotiations-without-economic-signals. The results are robust to the YPF

nationalization decision of 2012, as shown in Figure 1, showing that the central features of our empirical model did not suffer from that change.

On the potential implications of our work we stress that the importance of clarifying the factors behind the production performance of a well develop market such as Argentina in natural gas is crucial from both positive and normative perspectives. From a positive perspective we critically evaluate simple unconditioned arguments that explain aggregate production as arising from certain areas or firms and show instead that the phenomena is more general and therefore more market-driven. At a normative level, we hope to strongly contribute to current and future energy policy debates, pointing to economic incentives problems behind the status-quo policy and, while modeling the performance of conventional natural gas, helping at calling for the urgency to move towards non conventional gas development with appropriate incentives and price signals.