MACROECONOMICS OF ECONOMIC TRANSITION – DETERMINANTS OF THE PATTERN OF DEVELOPMENT

By

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Abstract

Our objective is to try to understand the rationale for and the effectiveness of different economic policies in a transition -- Central and Eastern Europe (CEE) and Caucasus and Central Asia (CCA) -- country setting: macroeconomic policy, international trade, international capital markets, human capital and, institutional structure.

We provide consistent, comprehensive analysis covering the interlinked questions of: i) how to achieve sustained, balanced / diversified economic growth; by means of growth accounting framework (case studies Azerbaijan and Kazakhstan) and using growth diagnostics methodology (case study Azerbaijan) we find that the main constraints can be summarised as: government (institutional) failure, human capital limitation, and corruption -- these factors may not be invariable for such range of countries but we aim to offer a general methodology; ii) "what break-ups do to countries", concluding that breakup countries experience, in general, deeper and shorter economic crisis, tending to grow afterwards predominantly faster; iii) is there a prospect for (swift) economic convergence in the "club" of the 28 former (CEE and CCA) centrally planned economies; we explore for a first time the issue in such setting and report that these countries are expected to reach half the distance to their (unconditional) non-growth steady state in around 50 years, though this may not guarantee catch-up with the industrialised countries; iv) what is the quality of governance relationship with the resource "curse" or "blessing" and find that some form of resource "curse" is expected to be observed in any country that extracts natural resource rent; however, a net negative effect would obtain only in countries with poor institutional structures; v) what insights to the Dutch disease transmission mechanism can be provided by utilising a version of the Salter-Swan model; vi) is the Balassa-Samuelson hypothesis (B-S) valid for the relevant setting (case study of Azerbaijan); by examining carefully this matter, both theoretically and practically, we confirm its validity; and, vii) what are the most important sovereign yield spreads determinants, and propose that the levels of spreads are likely to be subject to significant alteration by the impact from

financial market volatility and could potentially be pushed up or down at levels having little to do with their respective macroeconomic fundamentals; and,

Our empirical approach takes account of recent advances in econometric analysis of time series – fractional cointegration.

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I would like to express my gratitude to my supervisor Prof. Peter Sinclair of the Department of Economics at the Birmingham Business School, the University of Birmingham, for his exceptional supervision, advices and inspiration. He need not, however agree with all my statements and conclusion.

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List of Abbreviations

ANS	Adjusted Net Saving
ARDL	Autoregressive Distributed Lag
BMA	Bayesian Model Averaging
BSH	Balassa-Samuelson Hypothesis
CCA	Caucasus and Central Asia
CDS	Credit Default Swaps
CEE	Central and Eastern Europe
GK	Geary-Khamis
PPP	Purchasing Power Parity
PST	Prebisch-Singer Thesis
RAS	Resource Adjusted Savings
SSM	Salter-Swan Model
VECM	Vector Error Correction Model
VIX	Volatility Index (Chicago Board Options Exchange)

Introduction

Our objective is to try to understand the rationale for and the effectiveness of different economic policies in a transition -- Central and Eastern Europe (CEE) and Caucasus and Central Asia (CCA) -- country setting: macroeconomic policy, international trade, international capital markets, human capital and, institutional structure. All members of the latter group share the political, social and economic legacies of the Soviet Union era, while the former group of countries were former Soviet satellites.

If economic policies are inadequate or fail completely, this inflicts vast economic and social costs on the entire population and penalizes the incompetent policy-makers. When the outcome is different (in a democratic political system?) this reveals key problems for research and analysis. Utilising a consistent theoretical framework we inspect the economic systems under consideration to inform our analysis of direct and indirect economic effects and their broad consequences. There are various interlinked unresolved questions.

What is the key to successful integration ("skodalisation[1]") rather than marginalisation of transition economies? The common obstructions specifically characteristic of the transition economies include: i) missing markets and institutions; ii) rapidly embedded monopolies; iii) deficiency in implementation of adopted legislation; and, iv) inadequacies in the general institutional structure, both formal and informal.

[1] A term coined by Prof. Peter Sinclair (after the Czech automobile manufacture Skoda) symbol of the fast transition from central planning and sub-quality products to producing highly competitive ones and successful integration in the world economy.

What do break-ups do to countries? This necessitates empirical analysis of how economic cost and benefits of secession in CEE and CCA countries translate into subsequent patterns of economic growth.

Do we observe economic convergence and to what extent? If sigma shows divergence and beta is too slow can we help reverse the former and speed up the latter?

Why (transition) countries might suffer “resource curse”? We identify four different channels or transmission mechanisms (with various combinations and variations) which endeavour to account for the inverse statistical relationship between resource abundance and economic growth.

How does the transmission mechanism of the Dutch Disease operate within the framework of the Salter-Swan model? The model facilitates the understanding of the functions and relations of the key factors bringing about macro-economic imbalances; and, it makes available a structure within which the underlying principles and the expected outcomes of policy interventions can be analysed.

Is the Balassa-Samuelson effect valid for this setting?

What factors narrow or widen the sovereign bonds spreads?

Our aim is to help clarify and possibly resolve some controversies, as well as, to try to envisage the future tendencies.

Core characteristics of the structural reforms are similar in all the Caucasus and Central Asia countries (CCA). Macroeconomic conditions, resources, institutional structures, and management capacities are different. This differentiation resulted in streams of different speeds

and different outcomes within the common course of similar macroeconomic trends. All of these countries have been / are supported by comparable World Bank / IMF reform programs. Still their developmental potential -- defined as capacity across a set of political structures, market institutions and human capital essential for long-term economic development -- diverges; signifying path dependence and fundamental importance of these countries internal factors.

Table 1: Main macroeconomic aggregates – CCA and CIS countries, per cent

	Real Growth, 1990 - 2008				Real Growth, 1990 - 2012			
	GDP, Constant 2005 USD	Industry, value added	Agriculture, value added	Gross capital formation	GDP, Constant 2005 USD	Industry, value added	Agriculture, value added	Gross capital formation
Armenia	166	49	167	159	210	47	218	177
Azerbaijan	207	264	170	204	242	297	198	246
Belarus	168	165	149	183	194	190	172	206
Georgia	67	61	56	65	78	72	64	77
Kazakhstan	142	126	112	121	173	150	136	143
Kyrgyzstan	97	89	93	101	105	98	94	111
Moldova	58	49	47	66	62	53	51	64
Russia	112	103	100	106	116	107	104	110
Tajikistan	76	71	70	75	96	88	92	91
Uzbekistan	163	161	149	137	224	223	201	209
Ukraine	74	69	64	76	70	63	61	67
CIS	110.8	101.5	97.8	106	116.8	106.6	102.9	110.9
CIS -- Annual Average Growth Rate	0.6	0.1	-0.1	0.3	0.7	0.3	0.1	0.5

Data sources: World Development Indicators and CISSTAT (downloaded 28 March 2014)

The data in the table above illustrates that the GDP volume index for the entire CIS is bigger than the volume index of the output of industrial and agricultural activities as well as investment

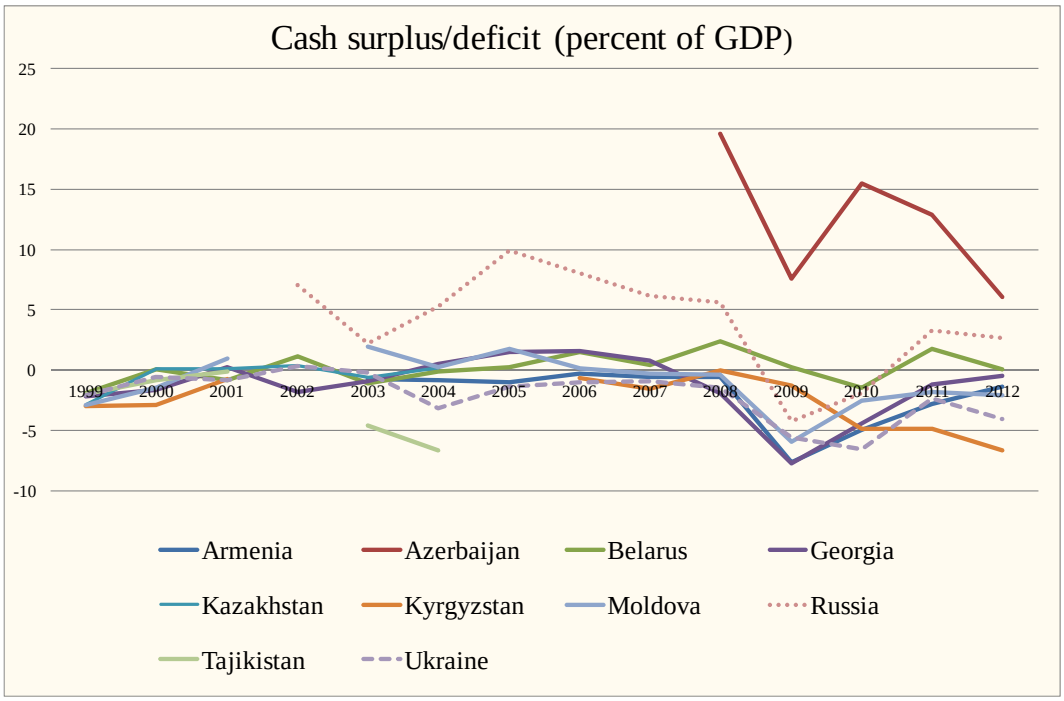
(in fact, the agricultural component has decreased) for the 1990 - 2008 period. In view of that, this rate of GDP growth must have resulted (to a great extent) from increases in services output, including trade, transportation, financial services, and general administration services.

There are considerable differences in the rates of economic growth amongst the CIS countries during the period 1990-2008. These range from 207 per cent for Azerbaijan to 58 per cent in Moldova. The ranks are quite persistent – extending the sample until 2012 we observe that Azerbaijan has the highest rate of economic growth (242 per cent) and Moldova has experienced the smallest, i.e., 62 per cent. Various factors may explicate these differences, including availability of natural resources, the commencing level of economic development, and the effectiveness and efficiency of economic and social policy implemented by the government.

Observing the annual average rates of growth in GDP, industry and agriculture value added and the gross capital formation show that, if anything, the period from the beginning of the transition period (the fall of the "iron curtain", 1990) until 2008 was characterised by slower growth even in comparison to the extended period up to 2012, notably including the period of the (still ongoing) Great Depression Mark II.

Nonetheless, the CIS countries generally succeeded in bringing their government finances closer to balance. Deficits were low, sometimes there were surpluses (see Figure 1, below). The majority of CIS countries also maintained their Sovereign debt (as a percentage of GDP) at acceptable levels, but external indebtedness has been rather high. Using GNI as denominator we observe a picture, of external debt increasing notably in the mid-90s, then enlarged growing even more in early 2000s, and eventually declining; only to be moved up again by the events of the economic and financial crises from 2008 (see, Figure 2, below).

Figure 1: Government Budgets Stance -- CCA/CIS countries



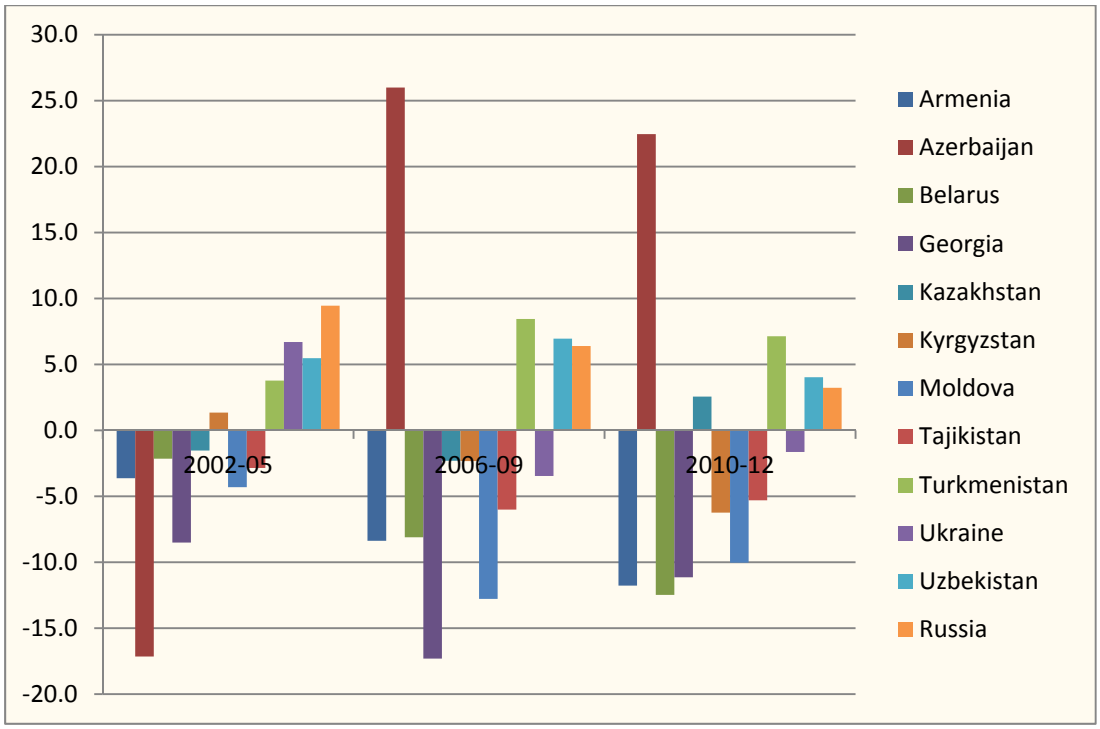
Data sources: World Development Indicators, World Bank

Figure 2: External Debt Stock

Data sources: World Development Indicators, World Bank

There are a number of indicators of certain accomplishments in the integration of the CIS countries into the world economy, including the sizeable expansion of external trade and increasing foreign investment. Thus, exports of goods by the CIS countries in 2008 increased about seven times compared with 1995.

Figure 3: Balance on Current Account CCA and CIS Countries, per cent of GDP



Source: World Economic Outlook, October 2010.

Note: For annual data (various sources) please see Annex 1.

However, the commodity structure of exports is changing very slowly, and exports of natural resources (predominantly oil) continued to take up a large share of exports over the last decade, especially in countries like Azerbaijan, Kazakhstan, and Russia (about 85, 52, and 65%, respectively). Conversely, the share of exports of machinery for the same year (2008) was less than 10% for the CIS as a whole, varying between 0.5% in Tajikistan and 10% in Ukraine.

Table 2: Net-oil Exports as a Share of Total Export and GDP, selected countries

	UNIT	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Azerbaijan	%	41.9	68.4	77.1	72.2	70.1	73.9	67.6	74.5	89.8	86.1	84.7
Iran, Islamic Rep.	%	82.7	70.4	114.5	94.9	64.2	68.7	77.0	84.2	82.0	66.8	68.1
Iraq	%	..	..	..	..	..	..	..	..	..	..	..
Kazakhstan	%	22.9	39.6	53.6	54.9	59.1	60.3	63.5	72.2	66.2	61.9	52.5
Malaysia	%	2.1	2.3	2.8	2.4	2.8	3.2	3.4	2.8	2.7	2.0	..
Norway	%	23.9	30.5	42.0	36.6	36.1	35.4	38.3	40.9	38.8	34.8	..
Saudi Arabia	%	86.0	86.6	101.0	92.4	83.8	88.3	91.2	94.7	90.7	85.3	91.8
Turkmenistan	%	37.1	47.7	35.6	29.1	33.8	32.0	39.5	38.2	24.5	25.2	31.4
Net Oil Exports as a share of GDP, %												
Azerbaijan	%	9.5	19.1	30.1	29.6	30.0	31.0	33.0	46.9	59.7	58.6	57.3
Iran, Islamic Rep.	%	11.3	15.1	26.0	19.4	17.0	18.7	22.4	27.8	26.6	21.5	22.2
Iraq	%	76.3	75.3	85.8	90.5	74.2	71.9	..	..	..	..	..
Kazakhstan	%	6.9	16.8	30.4	25.2	27.8	29.2	33.2	38.6	33.9	30.6	31.9
Malaysia	%	2.4	2.8	3.4	2.7	3.0	3.5	4.0	3.3	3.2	2.2	3.3
Norway	%	9.0	12.0	19.5	16.7	14.9	14.2	16.1	18.2	18.0	15.9	17.7
Saudi Arabia	%	25.7	30.2	44.1	36.8	34.5	40.7	48.0	57.6	57.3	55.4	64.2
Turkmenistan	%	12.1	26.8	34.0	23.7	23.3	19.9	24.4	24.8	18.1	15.8	14.9

Source: Author's calculations based on WB and EIA (Energy Information Administration USA) data

At present, after more than twenty years of transition, the CCA countries – despite displaying high (though varied) average real GDP growth -- still have to establish themselves as competently, industrialized, economic systems. This is to say that the development has been driven essentially by the export of primary commodities (mainly oil) and export of labour (mainly low qualified). This implies that the most important reforms intended to facilitate the transition to market economy are yet to be accomplished, or perhaps the implemented changes so far are lacking in coherence (Campos and Coricelli, 2002). The quality of governance in general, and the efficiency of the financial systems in particular lagged behind such developed structures in market economies.

One common problem of the CCA / CIS countries at that period (from 1996 to the year 2008) was the high rate of inflation. However, while there was a marked slowdown in the rate of CPI

growth since 2001, inflation remained high until 2008. Between 2006 and 2008 the period average of inflation for the entire CIS was 12 per cent (Cf. Table 3, below).

Table 3: Consumer price Indices and Inflation, CIS Countries, per cent

	1996-2000	2001-2005	2006-2008	2012
	Annual average inflation	Annual average inflation	Annual average inflation	Jan-Apr 2012 as per cent of Jan-Apr 2011
Armenia	8	3	5	2.1
Azerbaijan	3	5	15	0.1
Belarus	115	31	10	6.8
Georgia	14	6	9	
Kazakhstan	17	7	12	1.7
Kyrgyzstan	24	4	13	0.6
Moldova	22	10	13	1.2
Russia	37	15	11	1.8
Tajikistan	70	15	18	1.9
Turkmenistan	…	…	…	-0.8
Uzbekistan	…	…	…	2.7
Ukraine	29	8	16	0.7
Total CIS	39	13	12	1.7

Source: CISSTAT (downloaded April 2009 and updated in February 2015)

Another universal socio-economic problem for all CIS countries is the growing inequalities in the distribution of income. The differences between the shares of income received by the richest and poorest groups of population in the CIS countries are larger than in many developed market economies, and in some CIS countries income inequality has tended to worsen for several years.

Considering the entire period following the beginning of the market liberalization and reforms, a high degree of volatility in the main macroeconomic aggregates is apparent, reflecting the highly non-linear behaviour of these variables. The literature on transition offers three, in general complementary, interpretations, outlined as follows: i) volatility is a consequence of a Schumpeterian process of creative destruction, i.e., new efficient firms and sectors take over the old inefficient government structures. Hence, according to this analysis, observed volatility is an efficient, normal phenomenon; Campos and Coricelli (2002); ii) the second relates volatility to the underdevelopment of markets, especially financial markets; Calvo and Coricelli (1993). The lack of developed credit markets magnifies credit cycles, frequently ensuing large inter-enterprise arrears and destabilising the economy; and, iii) the third account asserts that volatility builds up from the failure to establish appropriate institutions that should facilitate transition and support the new market system (Acemoglu et al., 2005).

The rushed change in the CCA / CIS countries from the old centralized state plans, where all the information in the economy was completely integrated, to the excessively "free" and underdeveloped market system, appears to have been ill-advised. Nevertheless, the outlook for the economic future (despite the recent (2008) and still ongoing economic and financial crisis) is much more benign. The CCA countries (and Russia) form together a large market with high potential effective demand. These countries should be able to stabilize their economies. The question is how to achieve the change with minimal cost in human and financial terms, and select the optimum time paths for policy instruments to be applied and structural changes enacted.

Given appropriate measures, the different views and explanations of the causes of the initial output collapse see the main problem as a lack of efficiency and competitiveness. Confusing and misleading comments regarding value creation and destruction in the real economy follow them. Those comments present an oversimplified paradigm and leave the issue unexplained. The meaning of the term "value-subtraction ", i.e., negative value, which was used extensively in the early years of transition to describe the state of loss making government-owned companies, is only relative; it is valid only for exchange purpose. This is to say that certain productive activities do not yield a profit. However, goods that seem to have lost value during the process of production have their utility (user value) intact for consumers. No doubt these products were not up to the then modern standards of quality and efficiency in use, but they were actually demanded at that stage of economic development. The majority of the population could not afford the better imported brands, no matter what their preferences were. In this inspection, it is essential to tell again that consumer choice effect is exaggerated under normal economic conditions and it is irrelevant for all practical purposes at the time of crisis. Better policy and management could certainly have helped to avoid much of the loss of output and employment. When people's lives are at stake, every fraction of a percentage point reduction in output is significant. What, then, should the authorities in charge have done, and even more importantly, what they should do in the future?

Revitalizing the economy under the burden of debt, capital flight and the world economy not yet out of the Depression (Great Depression Mark II) is a difficult task. However, rebuilding has to start by using all available capital, not by "creatively" destroying it. Of course, on this issue two camps (both containing vast numbers of proponents) were fast to be established -- one

supporting the "big-bang" or "shock-therapy" approach, e.g., Berg and Sachs (1992) and another (less radical) suggesting that reform should be less chaotic and more gradually implemented, e.g., Portes (1991). A strong regulatory system appears to be a precondition for privatization, trade liberalisation, and setting up a proper financial system. Simultaneously, governments have to decide on an appropriate for the countries' framework industries[2] for industrial policy[3]. The strategy must be sufficiently broad to allow for technological changes and gradual renewal of capital stock; stabilising investment demand initially and then increasing investment spending.

While the development of CCA's financial markets did not come to a halt; if the capital markets are to achieve depth and volume, regulation has to be tightened and the rights and responsibilities of the participants clarified and duly reinforced. After these measures are applied, it will be much easier for economic agents to work efficiently and for the economy to start growing.

The next section provides analyses of the macroeconomic situation for several selected countries and then turns its focus to the natural resources abundance feature of these economies as a potentially essential factor in determining the patterns of their development.

2 "No country in the world has been able to move from low- to middle- and high-income status without undergoing the process of industrialization. [...] There is a need for some guiding principles on how "best" any society should move its human, capital and financial resources from low- to high-productivity sectors. For the process to be efficient, coordination issues and externality issues must be addressed. Markets typically do not manage such structural transformations on their own well (Stigltz, Lin and Monga, 2013)."

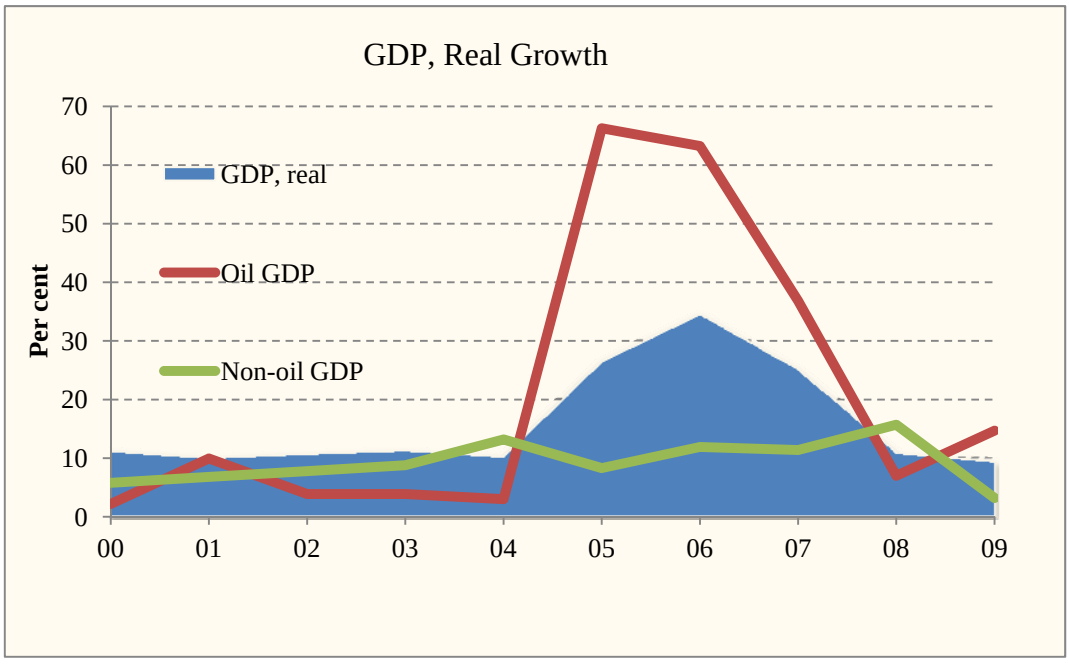
3 "Recent years have seen resurgence in the development of industrial policies by governments in the UK and overseas. In the UK, industrial policies have been developed in 11 sectors, led in most cases by groups from the public and private sectors, with many of these encompassing manufacturing industries. [...] In summary, manufacturing is too important to leave to its own devices (Sir Richard Lapthorne, Foresight, 2013)."

Chapter I: Macroeconomic developments in selected CCA countries after the fall of the "Iron curtain"[4]

Azerbaijan

Oil and gas made Azerbaijan the fastest-growing economy in the world, over the last decade, posting its seventh consecutive year of double-digit growth in 2008 (with real GDP expending by a record 34.5 per cent in 2006 and 9.3 per cent in 2009). Industry estimates provide evidence that the Caspian Sea holds some of the world's largest unexploited deposits of oil and gas. Azerbaijan is, as well, a resource-abundant country in transition which needs to make important decisions on how to wisely spend its vast windfall revenues, how possibly to circumvent the Dutch disease and move from resource dependence to build a diversified modern economy.

Figure 4: GDP real growth, by main components



[4] Most of the historic data used in this chapter is until 2008. This is due to three reasons: i) the chapter was written in 2010 – hence, general data availability; ii) the data used particularly in growth accounting and the regressions was obtained directly from the relevant authorities (macroeconomic departments) during author's tenure there as an adviser; and, iii) the beginning of the economic and financial crises of 2008 (the Great Depression Mark II) would obscure such kind of analysis.

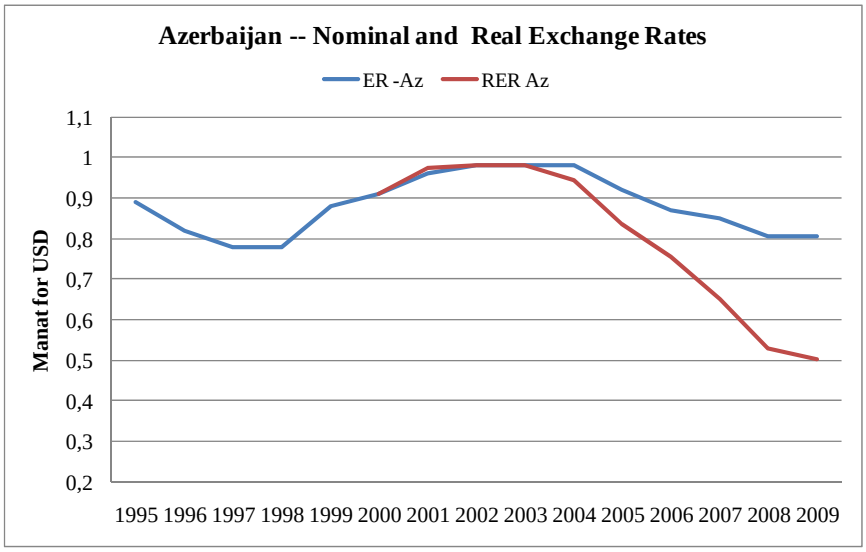
The way Azerbaijan is managing its huge oil revenues is determining the current and future development path of the country. Oil wealth can be an immense blessing or a severe curse. Extraction and export of natural resources tend to generate large streams of revenue. In the endeavour to receive this revenue as quickly as possible, often there is reliance on resource revenues without related development; economic diversification is neglected given the high (and impossible to match) profitability of extracting and exporting the non renewable natural resources. Even if diversification is attempted, it proves extremely difficult to implement as oil extraction appears so profitable and no other sector could possibly compete with it for capital investments and human capital. This adds force to further increasing the dependence on resource revenues. However while the oil sector provides large revenue, conversely it provides very few jobs. Due to its nature it operates in isolation with few connections to the rest of economy. The oil industry accounts for only about two per cent of the total employment in the country. While the private sector of the economy is formally established and becoming more important, the Azerbaijan's future economic development would depend on the ability of its companies to operate successfully in a competitive global environment. Implementing economic reforms at the most appropriate speed for the specific conditions of the country and applying sound macroeconomic policy is indispensable for achieving sustainable growth. Non-oil sectors in Azerbaijan, with the exception of some agricultural products and some processing of oil, are at present typically uncompetitive or largely non-existent. The lack of balance and diversification in the national economy of Azerbaijan pose a serious problem for employment and for long term economic sustainability. Diversifying economic growth is of paramount importance, research and support in this area should form the foundation of the Government's

activities. It may be prudent to allocate a substantial proportion of the oil and gas revenues to domestic manufacturing capacity development and to stimulate employment directly. The difficulties are related to the competent decision making and even more importantly to the willingness and the capacity to implement them.

Macroeconomic Developments and Problems

The trend towards an overvaluation of the currency, the Manat, which renders the non-oil sector increasingly non-competitive and attracts relatively cheap imports of consumption goods -- a typical symptom for the "Dutch disease" -- will lead to de-industrialization and cancel out any attempts to implement successful "export-led" or (the rather unappealing, though apparently favoured by the Government) "import-substitution" strategies.

Figure 5: Nominal and Real Exchange Rates Development in Azerbaijan



Source: Azerbaijan authorities and author's estimates
Note: RER -- Azeri Manat per US Dollar adjusted by relative prices -- US (CPI) towards Azeri (CPI).

Over the last decade the economy has experienced a pronounced increase in the inflation rate, which changed from around zero per cent in 2001 to above twenty per cent in 2008. There are

strong indications that the Balassa-Samuelson mechanism is at work, implying a divergence of wage rates between the oil and the non-oil sectors. Another problem is that the government budget financing is highly unbalanced. Only about a third of the budget is financed from non-oil taxes, the largest part coming from taxes on oil and transfers from the Oil Fund. Budget expenditure is focused on investment (almost half of the budget); a positive trend though has to be re-examined in light of our supplementary analysis. The government is under-taxing non-oil economic activities in general. The current account of the state budget exhibits a significant deficit (a surplus would be normally expected), which is regularly covered by oil revenues. A simple (though difficult to implement) design would be to establish a rule, which limits the use of oil revenue to investment expenditure[5] in the government budget; as a corollary a non-oil taxation would have to increase[6] to match an excessive government current spending.

In this regard, growth accounting methodology is particularly helpful in formulating scenarios about the future development of the economy. It can be made highly structured and detailed taking into account demographic, labour market development and investment decision by firms and individuals. Such scenarios can provide policy makers with quantitative information on policy options[7]. Our study is one of the first to conduct independently growth accounting for concrete Azeri data (at 2009), calculating contributions to GDP growth by factor inputs and their shares directly rather than estimating and/or respectively assuming them. Our findings tend

[5] This approach is aimed at avoiding the resource "curse". We illustrate the macroeconomic consequences from the high resource income disbursements when this rule is not followed trough a version of the Salter-Swan Model in Chapter II.

[6] This would tend to put political pressure on government to implement a sustainable macroeconomic policy.

[7] E.g., Giorno et al. 1995, Musso and Westermann (2005), and Henriot (ed.) 2008

to agree with the conclusions of Iradian (2007)[8] and differ from those of Izyumov and Vahaly (2008)[9]

Table 4: Growth Accounting -- Azerbaijan, 1996-2008

Growth Accounting -- Azerbaijan, 1996 - 2008													
	1996	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	***2008***
Quantity of Capital, thousand (manat)	18 074 001	17 989 001	18 415 000	19 401 000	20 414 000	23 560 001	26 035 000	29 764 001	34 251 001	40 763 001	46 041 001	56 284 000	*60 623 000*
Consumption of fixed capital	304 001	444 000	575 001	587 001	590 000	655 001	768 000	785 001	910 001	1 244 000	1 515 001	1 730 001	*2 424 920*
Per cent of capital	*2.9*	*2.5*	*3.2*	*3.1*	*3.0*	*3.0*	*3.1*	*2.8*	*2.8*	*3.3*	*3.5*	*3.4*	*4.1*
Gross fixed capital formation	795 000	1 168 000	1 221 001	1 076 000	1 091 001	1 216 000	2 066 000	3 779 000	4 922 001	5 172 001	5 567 001	6 069 000	*6 675 900*
Per cent of capital	*7.5*	*6.5*	*6.7*	*5.7*	*5.5*	*5.5*	*8.3*	*13.5*	*15.4*	*13.8*	*12.8*	*11.9*	*11.4*
Investment, net	491 000	724 000	646 000	489 000	501 001	560 999	1 298 000	2 993 999	4 012 000	3 928 001	4 052 000	4 338 999	*4 250 980*
Real net investment -- real growth of capital, %		*4.0*	*3.5*	*2.6*	*2.5*	*2.6*	*5.2*	*10.7*	*12.5*	*10.5*	*9.3*	*8.5*	*7.3*
Employed, thousands	3686.7	3694.1	2920	3202.1	3059.1	2989.3	3000.4	3022.4	3075.1	3163	3276.5	3316.8	*3341.2*
Self-employed	*601.4*	*601.4*	781.5	500.7	645.4	725.7	726.1	724.6	734	687.2	696.5	697.3	*714.8*
Total employment	4288.1	4295.5	3701.5	3702.8	3704.5	3715.0	3726.5	3747.0	3809.1	3850.2	3973.0	4014.1	*4056.0*
Employment, growth %	18.7	0.2	-13.8	0.0	0.0	0.3	0.3	0.6	1.7	1.1	3.2	1.0	*1.0*
Unemployment*	31.9	38.3	42.3	45.2	43.7	48.4	51.0	400.9	348.7	317.8	291.2	281.1	*262.2*
Unemployment rate %	0.9	1.0	1.1	1.2	1.2	1.3	1.4	9.7	8.4	7.6	6.8	6.5	*6.1*
Unemployment rate, change	0.1	0.2	0.1	0.1	0.0	0.1	0.1	8.4	-1.3	-0.8	-0.8	-0.3	*-0.4*
Gross Value Added, million	2 457	2 924	3 298	3 625	4 426	4 897	5 576	6 596	7 914	11 576	17 721	26 490	35 325
Gross Domestic product	2 732	3 158	3 440	3 775	4 718	5 315	6 062	7 146	8 530	12 522	18 746	28 360	38 005
RGDP	1 942	2 678	3 328	3 547	3 934	4 778	5 408	6 223	7 301	9 971	15 922	21 893	29 218
GDP Implicit Deflator	1.3	1.1	1.0	1.0	1.1	1.0	1.0	1.1	1.1	1.2	1.1	1.2	1.2
RGVA Growth rate, %	-1.3	9.0	13.8	7.5	8.5	7.9	10.4	11.6	10.7	26.0	37.5	23.5	10.3
RGDP Growth rate, %	1.3	5.9	9.9	7.4	11.1	9.9	10.6	11.2	10.1	26.4	34.5	25.0	10.8
Real growth contributions, %	1.2	5.8	9.9	7.4	11.1	9.9	10.6	11.2	10.1	26.4	34.5	25.0	10.8
Capital percentage		**3.0**	**2.6**	**1.9**	**1.8**	**1.9**	**3.3**	**6.5**	**7.1**	**6.9**	**6.6**	**6.2**	**5.4**
Labour percentage		**0.0**	**-3.5**	**0.0**	**0.0**	**0.1**	**0.1**	**0.2**	**0.7**	**0.4**	**0.9**	**0.3**	**0.3**
TFP percentage		**2.8**	**10.8**	**5.4**	**9.3**	**8.0**	**7.2**	**4.5**	**2.3**	**19.2**	**27.0**	**18.6**	**5.2**
1-α (capital share), %		0.8	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.7	0.7	0.7	0.7
Capital-output ratio (in real terms)		6.7	5.5	5.5	5.2	4.9	4.8	4.8	4.7	4.1	2.9	2.6	2.1
Compensation of employees	513 000	621 000	663 001	791 000	1 021 000	1 067 001	1 620 000	2 122 000	2 820 001	3 211 000	4 308 001	5 934 000	7 677 587
Labour share		0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.3	0.2	0.2	0.2
Labour share adjusted for the imputed labour income of the self employed		0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.3	0.3
Growth of productivity		37.6	44.2	6.5	10.9	21.1	12.9	14.4	15.4	35.1	54.8	36.1	32.1
** Figures for 1995-2002 show the number of officially registered unemployed*													
*** The same as GDP implicit deflator*													
**** Note: As statistics on deflators is not available we deflate with the average of the value of capital*													
at the beginning and end of respective year.													
*****Labour share of value added = Compensation of employees / TVA*													

Source: Author's own calculations based on national authorities' data, 2009.

[8] For the period 2001-2006 the average values of real growth factor contributions compare as follows:

	Capital	Labour	TFP
Iradian, 2007	6.8	0.2	8.1
Petkov, 2009	5.4	0.4	11.4

[9] For the period 1998-2005 the average values of real growth factor contributions compare (implied) as follows:

	Capital	Labour	TFP
Izyumov and Vahaly, 2008	2.1	1.5	8.7
Petkov, 2009	4	-0.3	8.3

Labour inputs are typically measured in total hours worked / employment and capital inputs in terms of the stock of physical capital (assuming the latter to be proportional to the flow of services that derive from it). These data are observable and generally available from the State Statistics Commission of the Republic of Azerbaijan.

Aggregate production function in combination with competitive factor markets constitutes the growth accounting framework. Growth accounting is a method used in economics to calculate contributions of different factors of production to economic growth and to derive the rate of total factor productivity (TFP), measured as a residual, in an economy. The approach is credited to Robert Solow (1957).

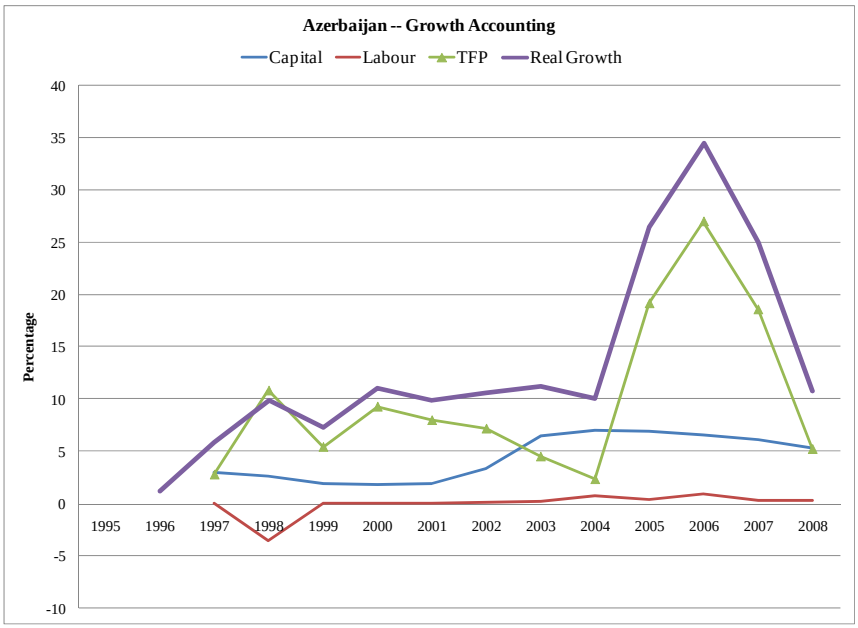
$$Y(t) = A(t)K(t)^{1-\alpha}H(t)^{\alpha}$$

The parameter α, is representing the elasticity of output with respect to labour and can be described as the labour share in national income. This is valid in conditions of perfect competition, when in equilibrium the marginal product of each factor is equal to its price. The effect of capital (*K)* and labour (*H)* components on growth is proportional to the respective shares of factors. National accounts of Azerbaijan allocate to the compensation of employees 20 to 30 per cent of the GVA in the period from 1996 to 2008. Adjusted for the imputed labour income of the self-employed, the labour share is on average slightly above 30 per cent. These findings appear counterintuitive, but taking into consideration the specificity of the Azeri labour market (in particularly the interaction of formal and informal remuneration) and that the annual

average growth rate of capital[10] is very high at about 11 per cent over the period of 1996 to 2008[11] may render them informative.

These calculations (above) manifest important developments in the observed macroeconomic indicators: TFP (*A*); capital; and, labour contribution to economic growth. It is clear that economic growth[12] is largely driven by increase in TFP[13].

Figure 6: Contribution to Economic Growth



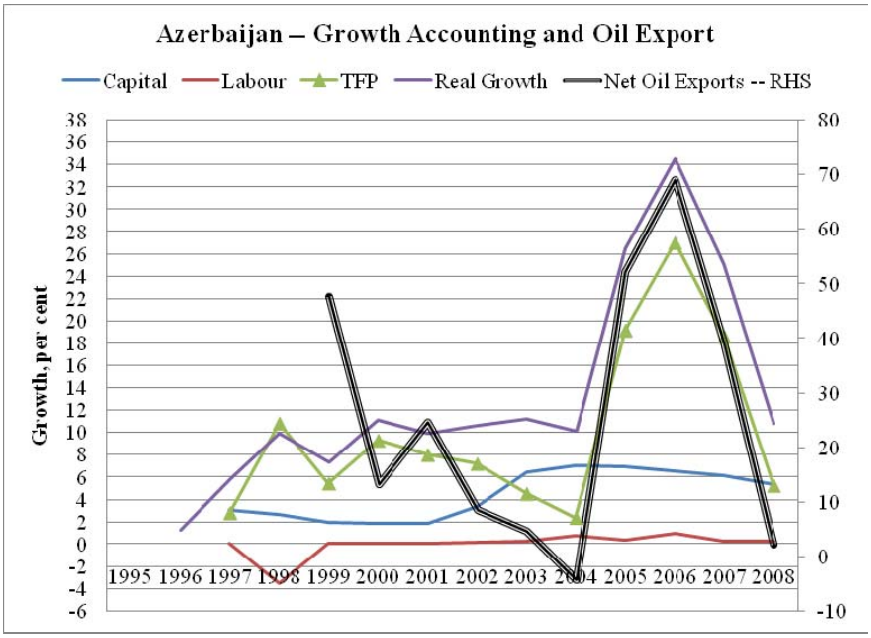
[10] In calculating the capital stock we apply the Perpetual Inventory Method. We calculate the existing capital stock on the basis of the available time series of investment data; information on the initial capital stock at the beginning of the investment time series; and time series of the consumption of fixed capital stock.

[11] Berlemann and Wesselhoft (2014), estimate Azerbaijan's annual capital stock growth rate throughout the period 1991 -2010 at record high – 19 per cent. However, taking into consideration that the data for Azerbaijan before1995 is most impausible would rather make it conssitnt with our estimate.

[12] "Accounting is not explaining the underlying causes of growth. Growth accounting and productivity measurement identifies the relative importance of different proximate sources of growth. At the same time, it has to be complemented by institutional, historical and case studies if one wants to explore the underlying causes of growth, innovation and productivity change (OECD Manual, 2001)"

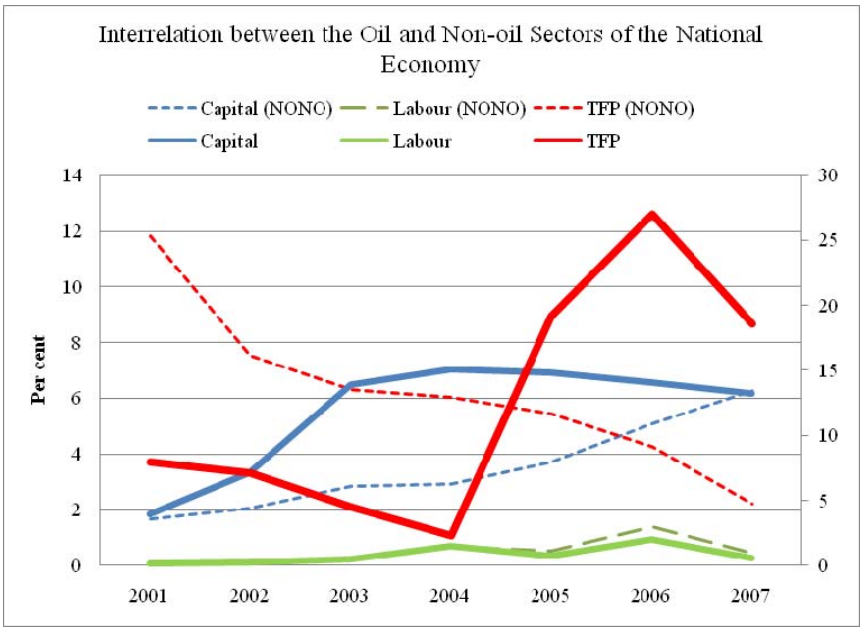
[13] This finding is supported by other studies, e.g., Izyumov and Vahaly (2008)

Figure 7: Contribution to Economic Growth in Relation to Net Oil Export



While non-oil GDP growth appears rapid, at about 16 per cent in 2008, it is based mostly on strong expansion in the non-tradable sectors -- construction, services and, to some extent, communications. The total GDP growth, based on increased oil extraction and high oil prices, contributed to a major rise in the per capita GDP, reducing poverty and unemployment. Still, the productivity of the sector employing the largest share of Azerbaijan's labour force – agriculture – remains very low. Although the oil sector accounts for more than half GDP and more than 90 per cent of industry, this sector employs less than 2 per cent of the workforce. Despite the considerable government investments, the country suffers from unbalanced regional development, growing inequality, high unemployment and underemployment, and inadequate social services and infrastructure.

Figure 8: Interrelation between the Oil and Non-oil Sectors of the National Economy



Supplementary analysis suggests that the link between the oil and the non-oil economy is weak on the production side, though it is important as far as inflation, wage levels, and particularly budget financing are concerned. Based on an input-output table analysis[14] (simulation) for 2006, a 10-percent increase in the volume of oil exports would generate only half a percent increase in the gross production of the non-oil sector, and an increase of about 0.7 percent for value added.

The Macroeconomic Impact of Oil (the oil fund) through the Government Budget

One generally accepted principle in the area of the public expenditure management is that robust budget systems facilitate efficient public expenditure management (PEM)[15]. PEM has three overarching and interrelated objectives: i) to make certain that the government operates within

[14] We use 25 sectors Input-Output Table for 2006; the core of the model is the Leontief inverse matrix, i.e., set of multipliers. The procedure shows how an increase in final demand – 10% increase in the volume of oil export -- transforms into increased output via the I-O model. This leads to an increase of 0.5 per cent of the non-oil GDP and 0.7 per cent of its value added.

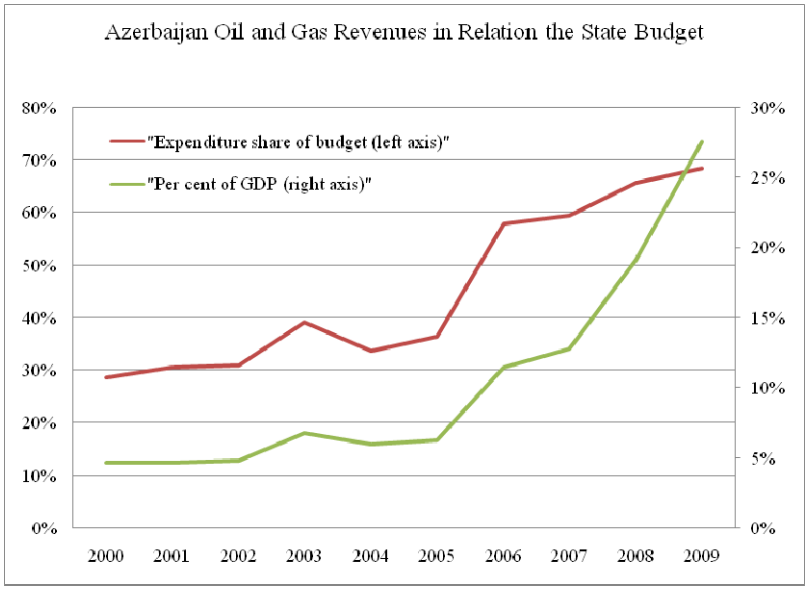
[15] World Bank (1998)

resources plausibly available; ii) to allocate resources across national priorities in a clear and consistent way; and iii) to guarantee that once the resources are allocated, the selected activities are financed in the most effective and efficient way. Government budget procedures – and the budgets as such – are basically the relevant apparatus for attaining of the goal of public expenditure management.

To promote market-oriented and efficient development, changes would have to occur in how the Government of Azerbaijan is organized and operates. In terms of generalisations for economic development prospects – it is clear that there is no genuine development strategy, nor set of efficient institutions that might have been able to implement such a strategy and cultivate economic development[16]. Rather than copy pro forma the "best practice" used elsewhere, it would be more productive to conduct a realistic analysis of the current resources and capabilities in the particular circumstances of Azerbaijan and study how these relate to the prevailing constraints and opportunities in the global economy. Improving capacities in macroeconomic and fiscal management and enhancing the procedures for budget preparation, will help in moving forward and improving the budget system in the long term, and increasing the speed and quality of execution. Timely formation of the processes and rules of the budget preparation (drafting) helps to produce high quality budget estimates and assessments.

[16] "Azerbaijan has reached a critical stage in its development. With oil output set to decline from 2017 and the economy's dependence on accumulated hydrocarbon revenues very high, diversification of the economy will be critical to ensure that Azerbaijan enters the post-oil period with a modern and vibrant private sector. Although the authorities have adopted ambitious targets for diversification under the Vision 2020 strategy and have made some progress in modernising the economy, structural reforms needed to support self-sustaining growth in the non-oil sectors should be accelerated (*Strategy for Azerbaijan*, EBRD, 2014, p.2)."

Figure 9: Azerbaijan's Oil and Gas Revenue in Relation to the State Budget



The Macroeconomic Impact of Monetary Policy

The policy reaction of the Central Bank of Azerbaijan (CBA) to the beginning of (October, 2008) world economic and financial crisis has been rapid and idiosyncratic. The CBA has relaxed monetary policy considerably, reducing the refinancing rate by 13 percentage points in less than a year; still this interest-rate reduction did not prove to be very effective. This is due, at least partly, to the fact that during times of extreme financial and economic turbulence conventional channels of monetary-policy transmission are undermined or simply blocked[17]. As an essential illustration we estimate the following equation in the tradition of the monetary paradigm of price level and inflation[18]:

eq. 1 LOG(CPI_AZ) = C(1) + C(2)*LOG(M2_GDP_AZ_K) + C(3)*CBR_AZ

where,

CPI_AZ – Consumer Price Index (Azerbaijan)

[17] Keynes (1936), Krugman (1998), and Craig (2011)

[18] Friedman (1994), and Bernanke (2003)

M2_GDP_AZ_K – Monetary Aggregate M2 as a Ratio to GDP at Constant Prices (Azerbaijan)

CBR_AZ – Central Bank Interest Rate (Azerbaijan)

C(1) – Intercept

C(2) and C(3) -- Parameters

We begin by applying the (ADF) unit root test to all of the above variables, based on the following regression:

eq. 2 $$\Delta X = \alpha_0 + \alpha_1 T_i + \delta X_{t-1} + \sum_{i=1}^{k} \gamma_i \Delta X_{t-i} + u_t$$

The lagged first difference terms are added to remove any serial correlation in the error term and *Ti* is a time tend. The values reported in Annex 1, Table 43 suggest that the correct order of the ADF regression is three and that all variables are not trend stationary at the one per cent confidence interval level. Given the small sample size (for now) we tentatively assume that the variables under investigation are first difference stationary and move on and apply the two step Engel- Granger approach to cointegration.

"In most cases**,** if we combine two variables which are I(1), then the combination will also be I(1). More generally, if we combine variables with differing orders of integration, the combination will have an order of integration equal to the largest. i.e., if Xi,t ~ I(*di*) for i = 1,2,3,...,*k*. So we would have *k* variables each integrated of order *di*.

Let $z_t = \sum_{i=1}^{k} \alpha_i X_{i,t}$, then *zt*~ I(max *di*). Many time series are non-stationary but "move together" over time – that is, there exist some influences on the series (for example, market forces), which imply that the two series are bound by some relationship in the long run. A cointegrating relationship may also be seen as a long-term or equilibrium phenomenon, since it is possible that cointegrating variables may deviate from their relationship in the short run, but their association would return in the long run (Brooks, 2002)."

In step one (of the Engle-Granger two step method) we already made sure that all the individual variables are I(1), then we estimate the cointegrating regression using OLS, save the residuals of the cointegrating regression, and test these residuals to verify that they are I(0).

The cointegrating regression (eq.3, below) hypothetically expresses the behavioural relationship between the dependent variable "logarithm of consumer price index of Azerbaijan" and the independent variables "logarithm of the ratio of money supply (M2) to real GDP" and the "central bank interest rate". It seems that the model has very high explanatory power; the coefficient of mutual determination corrected for degrees of freedom equals 0.9379 and the Durbin-Watson statistics is equal to 2.5298. The signs of the coefficients are correct. The relationship between "logarithm of the ratio of money supply (M2) to real GDP" and "logarithm of consumer price index of Azerbaijan" expressed by the regression coefficient in front of the former is of average strength and highly significant (t-statistics in square brackets, see equation 3, below) suggesting that for every one per cent increase in money supply/real GDP ratio, consumer price index moves in the same direction by about 0.33 per cent. The central bank real interest rate influence on the dependent variables is low -0.12 (regression coefficient -

0.0012*100, i.e. we are multiplying the regression coefficient by 100 to account for the semi-log form) and just on the border of significance, resembling probably correctly the passive role of interest rates in Azerbaijan's economy.

eq. 3 LOG(CPI_AZ) = 4.5155 + 0.3257*LOG(M2_GDP_AZ_K) - 0.0012*CBR_AZ
[123.184] [12.9742] [-1.9781]

Next, we apply two tests -- Augmented Dicker-Fuller Test and Phillips-Perron Test -- to the residuals of this regression, which strongly reject the existence of unit root (at one per cent level of significance) in the residuals. Hence, we establish that there is a long-run relationship among the variables of equation 3, above. As a step two in the Engle-Granger Approach to Cointegration we use (the obtained in step one) residuals in an error correction model (See Table 5, below). The error correction term turns out to have the expected (negative) sign, being both sizable (regression coefficient equal to -0.4512) and strongly significant (t-statistic equal to -3.7800). This is to say that according to the usual interpretation the consumer price index in Azerbaijan would approach its equilibrium level in about two years' time.

Table 5: Inflation Estimation Equation Azerbaijan, Two-step Engle-Granger, Error Correction Representation

Dependent Variable: D(LCPI_AZ)
Method: Least Squares
Date: 10/30/10 Time: 20:22
Sample (adjusted): 1997 2008
Included observations: 12 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.186937	0.043271	-4.320194	0.0035
RESID_AZ(-1)	**-0.451167**	0.119354	**-3.780080**	0.0069
D(LCPI_AZ(-1))	0.222183	0.101810	2.182331	0.0654
CBR_AZ(-1)	0.006819	0.002509	2.718028	0.0299
@TREND	0.019879	0.002821	7.047970	0.0002

R-squared	0.964790	Mean dependent var	0.050077
Adjusted R-squared	**0.944670**	S.D. dependent var	0.073581
S.E. of regression	0.017308	Akaike info criterion	-4.980967
Sum squared resid	0.002097	Schwarz criterion	-4.778922
Log likelihood	34.88580	Hannan-Quinn criter.	-5.055771
F-statistic	47.95134	Durbin-Watson stat	1.998588
Prob(F-statistic)	0.000036		

To check whether these results are robust as to the choice of the estimation technique we re-estimate the relationship between the same variables by applying the simultaneous Johansen Vector Error Correction Model (VECM)[19] approach. From the estimated co-integration vector (detailed results are presented in Table 6, below) the following long-run relationship is derived:

eq. 4 LCPI_AZ = 0.4554*LM2_GDPK +0.0014*CBR_AZ
[6.233] [-1.2364]

[19] Vector autoregression (VAR) was pioneered by Sims (1980) as a method that could be used to characterize the mutual dynamic behaviour of a collection of variables without requiring strong restrictions to identify underlying structural parameters. It has become a widespread method of time-series modelling. When the variables of a VAR are cointegrated, we can apply vector error-correction model (VECM) model.

Table 6: Inflation Estimation Equation Azerbaijan, Johansen VECM Approach

```
      Cointegration with unrestricted intercepts and no trends in the VAR
          Cointegration LR Test Based on Trace of the Stochastic Matrix
*****************************************************************************
 13 observations from 1996 to 2008. Order of VAR = 1.
 List of variables included in the cointegrating vector:
 LCPI_AZ         LM2_GDPK        CBR_AZ
List of I(1) exogenous variables included in the VAR:
 CBR_AZ
 List of eigenvalues in descending order:
.85928     .43029      .0000
*****************************************************************************
 Null    Alternative    Statistic     95% Critical Value     90%Critical Value
 r = 0      r>= 1        32.8067           23.3200                20.7500
 r<= 1      r = 2         7.3142           11.4700                 9.5300
*****************************************************************************

ECM for variable LCPI_AZ estimated by OLS based on cointegrating VAR(1)
*****************************************************************************
 Dependent variable is dLCPI_AZ
 13 observations used for estimation from 1996 to 2008
*****************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 Intercept                  2.9590             .58160             5.0877[.000]
 ecm1(-1)                   -.67050            .13449            -4.9855[.000]
*****************************************************************************
 List of additional temporary variables created:
 dLCPI_AZ = LCPI_AZ-LCPI_AZ(-1)
 ecm1 =    1.0000*LCPI_AZ   -.45539*LM2_GDPK -.0014339*CBR_AZ
*****************************************************************************
 R-Squared                     .69321   R-Bar-Squared                   .66532
 S.E. of Regression            .045849  F-stat.    F(  1,  11)   24.8557[.000]
 Mean of Dependent Variable    .060089  S.D. of Dependent Variable     .079254
 Residual Sum of Squares       .023124  Equation Log-likelihood        22.7108
 Akaike Info. Criterion       20.7108   Schwarz Bayesian Criterion     20.1459
 DW-statistic                  .89718   System Log-likelihood          29.2443
*****************************************************************************
```

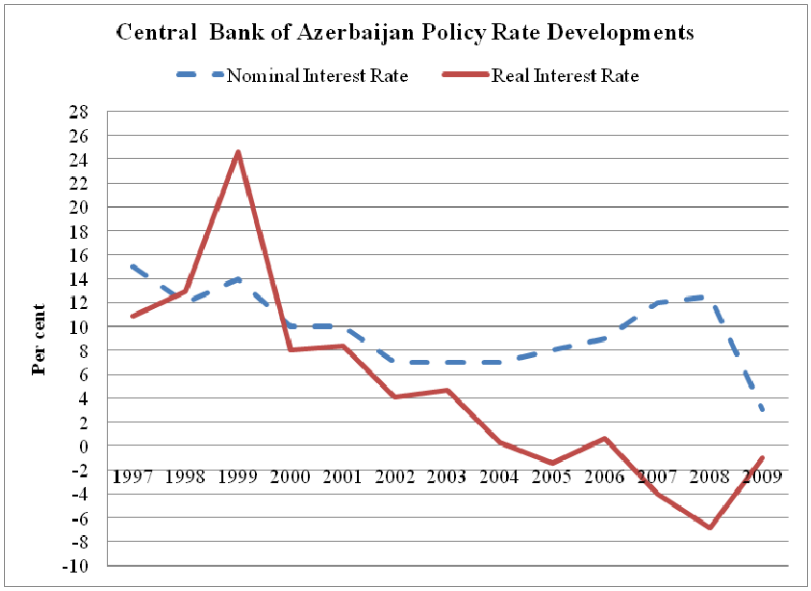
The results in respect to the regression coefficient in front of the "logarithm of the ratio of money supply (M2) to real GDP" variable are of the same order of magnitude, with the same sign and strongly significant. In respect to the regression coefficient in front of the "central bank interest rate", it is of the same magnitude, statistically insignificant (as in the initially estimated co-integrating equation) and with the "wrong" sign. The CBA is directly accountable to the President of the Republic of Azerbaijan, while it has some restricted operational autonomy[20]. In

20 *"Article 6: Independence of the Central Bank*

6.1. The Central Bank shall be independent in discharge of its responsibilities and exercise of its authorities prescribed by the Constitution and laws of the Republic of Azerbaijan, and no state authority or self administration body, physical person or legal entity may directly or indirectly by any reason, illegally influence or interfere with its activities. In case of any restrictions of the CBA's activity, interference with the affairs of the National Bank or any influence on the CBA senior management, the Chairman shall inform the President of the Azerbaijan Republic.

principle, the Central Bank of Azerbaijan (CBA) has followed an accommodating monetary policy. In Sept. 2009 CBA embarked on direct financing of the economy under state guarantees. One such example is the disbursement of one billion dollars (for seven years) to the State Oil Company (SOCAR) with an annual interest rate of three per cent "at least for the first couple of years". These types of actions contribute potentially, via the inflation channel, to keeping the CBA's policy interest rates negative in real terms over the last five years or so.

Figure 10: Central Bank of Azerbaijan Nominal and Real Policy Rate, 1997-2009



While the Central Bank of Azerbaijan is intervening extensively on the foreign exchange market to diminish the nominal appreciation of the manat it should be clear that the real exchange rate determination significantly depends on the interrelation of the traded and non-traded goods prices. There is a strong positive relation between government spending and the real exchange rate. A rise in government spending on non-traded goods can lead to a rise in relative prices of

---

6.2. The Central Bank shall report only to the President of the Republic of Azerbaijan."

(Law of the Republic of Azerbaijan on the Central Bank of Azerbaijan, 2004)

non-traded goods and to a sharp appreciation of the currency's real value, even if its nominal value is relatively unchanged. This would suggest undervaluation[21].

The commercial banking system is underdeveloped, small and concentrated. Despite the large number of banks, 46 at the end of December 2008, one bank – International Bank of Azerbaijan – which is government owned has a prevailing position with 43 per cent of total bank assets, whereas the respective shares of all other banks are no higher than six per cent (see Table 7, below).

Table 7: Azerbaijan's Banking System -- Market Share by Total Assets, millions of manats

	December 2008		December 2007	
	Assets	Market Share (%)	Assets	Market Share (%)
International Bank of Azerbaijan	4,370	43	2,601	39
Bank Standard	619	6	620	9
Kapital Bank	578	6	249	4
TexnikaBank	450	4	354	5
Unibank	418	4	390	6
Xalq Bank	404	4	212	3
Bank Respublika	388	4	253	4
Nikoil Bank	295	3	117	2
Azerdemiryolbank	229	2	150	2
AGBank	211	2	160	2

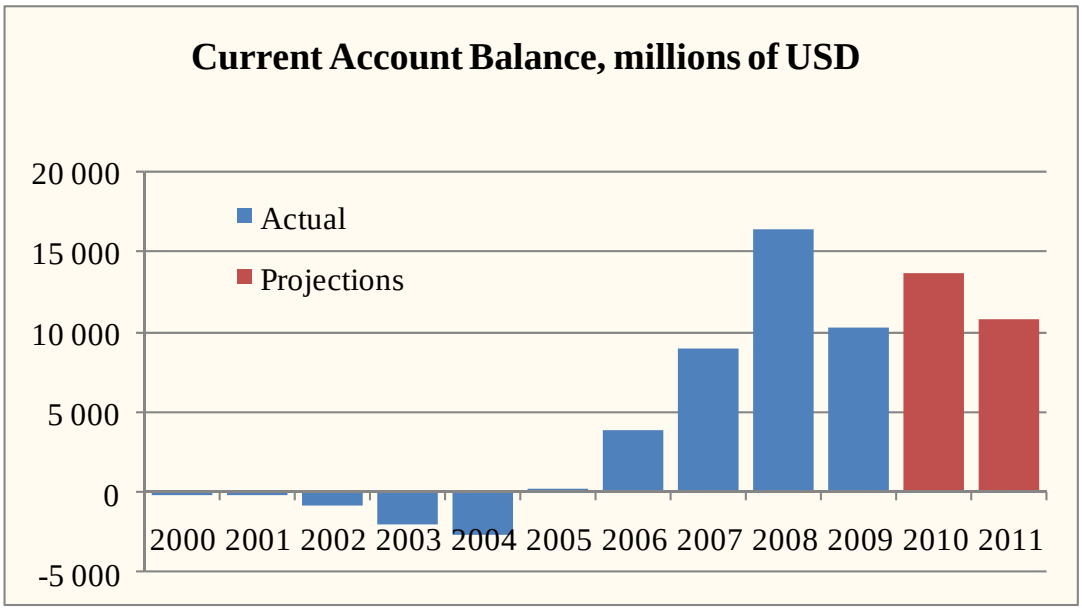
Source: Central Bank of Azerbaijan.

Note: Assets are measured in million manat

[21] A currency is considered undervalued when its nominal foreign exchange value is less than its "real" exchange rate value based on economic conditions and accepted theory. In terms of Figure 5 this is to say that in 2009 one would be paying about 0.8 manats for $1, whereas the "real" exchange rate should have been around 0.5 manats per $1, i.e., the manat is undervalued as we are paying more that is justified by the presented analysis. The Balassa -- Samuelson hypothesis offers in general a theoretical justification of the long run trends in real exchange rates in relation to productivities and prices (see Chapter II).

Booming oil exports strengthen the balance of payments of Azerbaijan and despite the world economic and financial crises it is projected to remain (strongly) positive for the year 2010 and beyond.

Figure 11: Current Account Balance, Azerbaijan



Source: Central Bank of Azerbaijan and author's calculation

Figure 11, above, reveals that Azerbaijan, in common with most of the other oil and gas exporters of the region, has built-up substantial foreign reserve positions (over the last few years) owing to the soaring gas and oil prices and increased extraction rates. The country could utilize some reserves to sustain its economic activity and make available some social safety net to those most at risk.

Economic Growth, Degree of Openness of the Economy and Gross Fixed Capital Formation

According to the Heckscher-Ohlin (H-O) theory of international trade, the process of trade integration (if such is to come about) will likely lead Azerbaijan (and the group of Caucasus and

Central Asia countries) -- characterized by underdeveloped capital stock and low-cost labour -- to a decline in the relative prices of capital intensive goods (factor price equalisation) and increasing export of labour-intensive goods. Furthermore, theories of economic growth appear to determine a positive impact from the modernization of the basket of exports of a given country in achieving faster growth and convergence[22]. Empirical studies have tested the correlation between the dynamics of exports and growth processes. Overall, exporting tends to lead growth and economic convergence[23]. Some studies argue that this depends on the level of economic development of the country[24]. Economies that have a very low or a very high level of economic development may not show evidence of a significant relationship between the increase in exports and economic growth.

It appears that only for countries with a medium level of economic progress is there a significant correlation between the extent of economic openness and the rate of economic growth. Dritsakis et al. (2005) analysed the relationship between economic growth, investments and exports for the former Soviet Union Country -- Ukraine. The end results give support for the existence of a cointegration relationship between these variables, and for a positive impact of exports and investment on real GDP growth. As far as the investments are concerned, the H-O theory supports the importance of the capital stock augmentation for the countries that are at a low level of economic development, though the impact on economic growth is expected to be significant only until a steady state of income growth is accomplished. The sources of

[22] Hausmann, Hwang, and Rodrik (2005)
[23] Lin and Li (2001)
[24] Dodaro (1993)

investment would be based on the foreign direct investment inflows and enhancement of the domestic savings rate.

Hence, as an empirical illustration for Azerbaijan, we estimate the (potential long-term) relationship between real GDP, gross capital formation, and the degree of openness of its economy over the period 1995-2008.

eq. 5 LOG(RGDP_AZ) = C(1) + C(2)*LOG(TRADE_SH_AZ) + C(3)*LOG(GFCF_AZ)

Where,

LOG(RGDP_AZ) -- logarithm of real GDP

LOG(TRADE_SH_AZ) – logarithm of the sum of exports and imports divided by GDP

LOG(GFCF_AZ) – logarithm of gross fixed capital formation

eq. 6 LOG(RGDP_AZ) = 3.5447 - 0.4588*LOG(TRADE_SH_AZ) + 0.56*LOG(GFCF_AZ)

[5.5896] [-0.4448] [2.9934]

This equation has very reasonable explanatory power; the coefficient of mutual determination corrected for degrees of freedom equals 0.60613 and Durbin-Watson statistic equals 1.0663. The relationship between log real GDP and the log of GFCF of Azerbaijan expressed by the regression coefficient in front of the latter is relatively strong and highly significant (t-statistics in square brackets) signifying that for one per cent increase in GFCF, real GDP increases by about 0.56 per cent. The regression coefficient in front of the log trade-share is negative, equalling 0.4588. The interpretation of the effect of this variable suggests that one per cent increase in the trade-share of Azerbaijan would lead to a 0.4588 per cent reduction in real GDP. Could it be that expanding

export (mainly oil), together with the induced import has a negative impact on real GDP growth? However, this coefficient is statistically insignificant.

Growth Diagnostics

Next we use Hausmann, R., Rodrik, D., and Velasko A., 2008, (HRV) growth diagnostics methodology in an attempt to identify the potential binding constraints to growth in Azerbaijan.

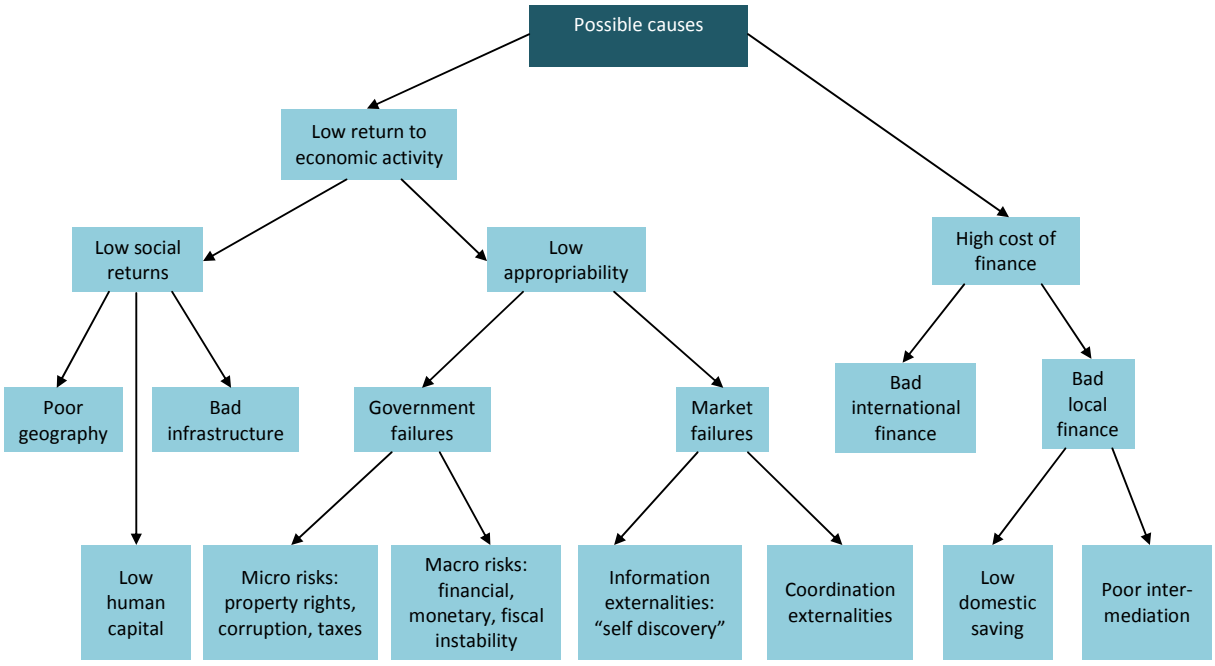
As explained by HRV, any analysis of economic growth in a given country should start "anew", not taking any assumptions for granted. This is to say that if one variable has been "proven" not to have explanatory power for the "average country", then it will not be mechanically decided that it should not be associated with the growth process in Azerbaijan.

Therefore, we look into the links between growth and trade openness without bias. Importantly, export composition is useful in providing a basis for Azerbaijan in helping the country to identify and develop new activities and goods and to put into operation the process of "self-discovery". Self-discovery refers to the efforts of entrepreneurs to find profitable opportunities through the production of goods or services innovative for the respective country, though they may be produced in other parts of the world (Hausmann and Rodrik, 2003).

Is it possible for Azerbaijan to move away from the heavy export concentration in primary commodities (oil) towards a more diversified export of sophisticated goods? The underperformance in growth in the non-oil sector relative to the oil one and the rest of the world is due not to lower investment rates but what is more to differences in the efficiency of transforming factors of production into final output, i.e., growth in total factor productivity (TFP). Productivity is also affected by market efficiency considerations and the quality of provision of public services.

The accumulation of factors and productivity growth are interlinked in a complex way making it difficult to disentangle their distinct effects on economic growth. For example, any misallocation of investment due to policy distortions or lack of policies supporting socially productive investments entails low aggregate output and therefore low TFP. Moreover, new technology in the form of new capital vintages is the key for TFP growth; hence it justifies the efforts to concentrate attention on the process of investment even when low TFP growth is clearly signalled out as problem. On the other hand, low aggregate productivity leads to low returns on investing in physical capital and lower private investment. Hence, the origin of the problem may be more easily recognized by examining the relevant implications for private investment.

Figure 12: Growth Diagnostics Methodology (GDM)



Source: Hausmann R., Rodrik D., Velasco A. (HRV) 2008, p. 326.

Following the HRV (2008) approach systematically, first we enquire:

A. Does the Azeri economy face low returns to domestic economic activity (investment)? Our answer is a clear "yes", which leads us to the inspection of social returns (investment potential) and of the extent of their possible appropriation as private returns.

- Is the problem one of low social returns? Yes -- Export baskets subject to Dutch disease. They do not support structural transformation towards higher development.

- Is the problem one of low private appropriability of investment returns? Yes -- Both, government failures obstructing sufficient appropriability; and, market failures – lack of private motivation to initiate investments with high social returns.

- Are there important government failures? Yes -- Lack of law enforcement (large informal economy and risk of expropriation) and macroeconomic risks (financial, monetary, and fiscal instability).

- Are there substantial market failures? Yes -- Monopolistic structures discouraging potentially interested entrepreneurs from any attempt at pioneering self-discovery.

B. Does Azerbaijan face a high cost of financing domestic investment? The answer is, as well, a firm "yes". Then the positive response to this question is further decomposed into replies to the sub-questions:

- Does the country have a low domestic propensity to save and/or problems accessing international finance -- Yes -- unattractive conditions for foreign direct investment.

- Does the country have problems with the domestic financial system -- Yes -- inefficient financial intermediation, poor bank regulation, and prevalence of related-party lending.

Are there useful indicators of binding constraints in one or more of these areas?

In the case of Azerbaijan, the growth diagnostic methodology suggests the conclusion that the main obstruction to growth is explained by low returns to economic activity, resulting in low private investment rates. The important question then is how to identify the weakest links in the investment process illustrated in the tree: that is to say, binding constrains, which could be potentially relaxed.

There is no simple way to distinguish between possible constraints and binding constraints -- in essence, conclusions are generally derived based on the predominance of the evidence discovered.

HRV promoted the idea that the central part to distinguishing binding constraints consist in examining relative prices and establishing if they appear to be out of line with those in "undistorted" economies. E.g., if the cost of capital (interest rates) is high relative to the international interest rate, this may indicate that capital is relatively scarce (a binding constraint) in that country. If it is not, then it can be inferred that the private returns of available investment opportunities are low. It is possible to add other barriers into the price space, for instance the incidence of risks and taxes.

In addition stock estimates may be essential to supplement flow data to reveal quantity imbalances. Growth accounting, based on stock data of factor inputs is very useful and may help, as well, to uncover constraints.

Table 8: Azerbaijan, Growth Accounting Non-Oil GDP, 2001-2008

	2001	2002	2003	2004	2005	2006	2007	2008
Quantity of Capital, million (manat)[1]	19092.1	20420.6	21969.8	23706.9	26339.9	29052.5	33605.3	
Gross fixed capital formation[2]	484.3	658.6	1015.3	1214.6	2013.7	2826.0	3941.3	7021.7
Per cent of capital	2.5	3.2	4.6	5.1	7.6	9.7	11.7	
Investment, net	484.2689	658.5843	1015.275	1214.618	2013.709	2825.971	3941.325	
Real net investment	479.7	645.7	985.2	1166.5	1913.5	2655.5	3658.0	
Real growth of capital, %	2.5	3.2	4.5	4.9	7.3	9.1	10.9	
Employment, million[3]	3666.7	3678.0	3698.3	3760.4	3801.3	3921.5	3962.7	4004.7
Employment, growth %	0.2	0.3	0.6	1.7	1.1	3.2	1.1	1.1
Unemployment[4]	48.4	51.0	400.9	348.7	317.8	291.2	281.1	262.2
Unemployment rate, change	0.1	0.1	8.4	-1.3	-0.8	-0.8	-0.3	-0.4
Gross Value Added, million[7]	3195.9	3693.9	4447.6	5242.5	6055.1	7630.0	10576.1	14750.7
Gross Domestic product	3195.9	3693.9	4447.6	5242.5	6055.1	7630.0	10576.1	14750.7
RGDP	3322.1	3635.7	4243.9	5050.6	5680.2	6776.2	8501.7	12241.2
GDP Implicit Deflator[5]	1.0	1.0	1.0	1.0	1.1	1.1	1.2	1.2
RGVA Growth rate, %	8.7	13.8	14.9	13.6	8.3	11.9	11.4	15.7
RGDP Growth rate, %	8.7	13.8	14.9	13.6	8.3	11.9	11.4	15.7
Real growth contributions, %	**13.6**	**9.7**	**9.3**	**9.6**	**9.7**	**10.7**	**8.9**	**15.7**
Capital percentage	**1.7**	**2.1**	**2.9**	**2.9**	**3.7**	**5.1**	**6.3**	
Labour percentage	**0.1**	**0.1**	**0.2**	**0.7**	**0.5**	**1.4**	**0.4**	
TFP percentage	**11.8**	**7.5**	**6.3**	**6.0**	**5.4**	**4.2**	**2.2**	
1-α (capital share), %	0.7	0.7	0.6	0.6	0.5	0.6	0.6	
Capital-output ratio	5.7	5.6	5.2	4.7	4.6	4.3	4.0	
Compensation of employees[8]	1067.7	1262.1	1620.4	2122.3	2954.8	3364.5	4474.8	5934.3
Labour share	0.3	0.3	0.4	0.4	0.5	0.4	0.4	
Labour share adjusted for the the self employed	0.3	0.3	0.4	0.4	0.5	0.4	0.4	

[1] *= quantity of capital minus fixed assets in mining*

[2] *Investment to fixed capital*

[3] *Employment from 1995 to 1999 covers the whole economy*

[4] *Figures for 1995-2002 show the number of officially registered unemployed*

[5] *Deflators for 1995-2000 are for the whole economy*

[6] *The same as GDP implicit deflator*

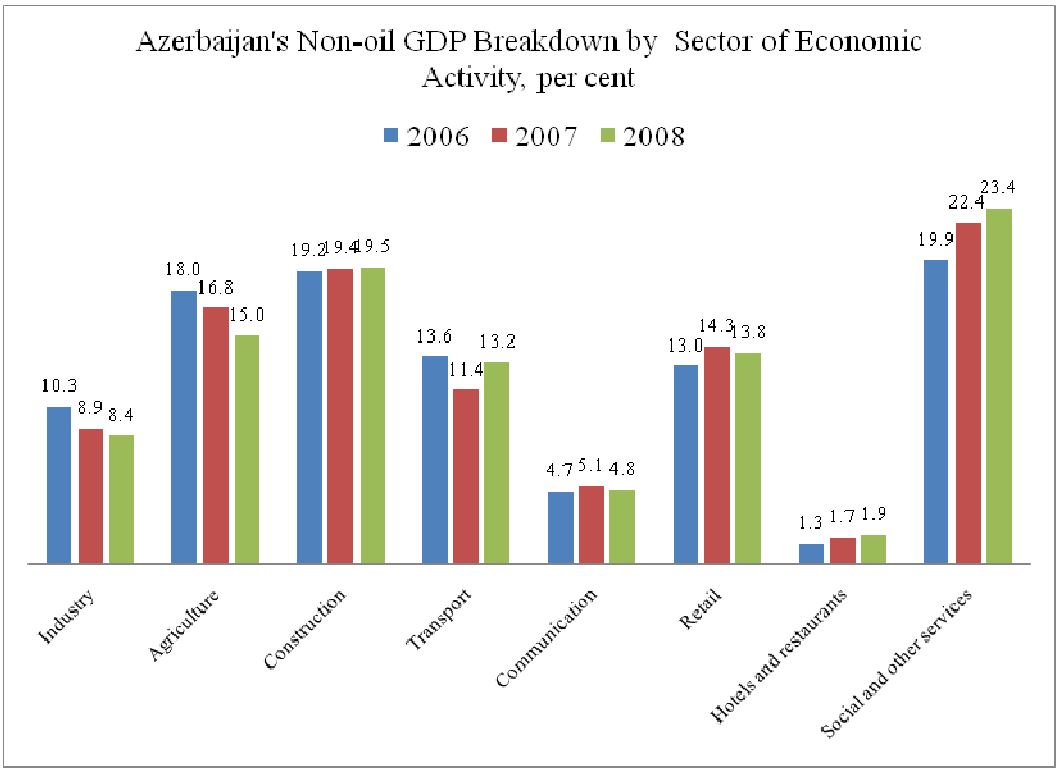
[7] *The same as GDP*

8 For the whole economy

Source: Author's own calculations based on national authorities' data, 2009.

Apparently, the growth of the non-oil economy over the recent past suggests that there is nothing to worry about with regard to competitiveness. Yet that strong growth rate is primarily due to the contribution stemming from non-tradables like construction, that is largely unaffected by the appreciation of the exchange rate. In contrast the tradables of Azerbaijan economy are by now showing signs of strain. Industrial and agricultural outputs as shares of non-oil GDP are steadily contracting over the last three years (see Figure 13, below).

Figure 13: Azerbaijan's Non-oil GDP Breakdown by Sector of Economic Activity, per cent



Another approach to look at constraints to growth in the decision tree framework is to shift the matter to the sector level and enquire about the reason why certain products expected to be produced and exported are not in the relevant country basket of goods and export. One can start by examining the progress of the collection of inventions in each country's exports over time

and observe the extent of consistency of their revealed comparative advantage with their per capita income. The concept in this test is that an export basket related to the demand of less developed countries indicates growth problems as "[t]he type of goods in which a country specializes has important implications for subsequent economic performance. Everything else being the same, an economy is better off producing goods that richer countries export (Hausmann, Hwang and Rodrik, 2005)."

A modification to this approach is to examine the potential for the export basket to transform itself into a better basket -- the value of its "open forest"[25], (Hausmann and Klinger, 2006). This notion suggests that transformation in exports is not accidental, but is rather guided by an endogenous blueprint based on the process of development. When a country becomes competitive in a given product or product group, a higher probability exists that it will turn out to be competitive in specific products but not in others. For example, "Oil exporters seem to have an export basket that provides few opportunities for future structural transformation, whereas many eastern European countries, as well as China, India, and Indonesia, seem to be in a denser part of the forest. (Hausmann and Klinger, 2006)"

Based on the GDM we arrive at some reliable insights about the structure of the Azeri economy. While investments are rather high, they appear generally misallocated, caused by public policy subsidising private investment in arbitrarily chosen sectors -- with low spillovers -- with an

[25] "We develop for each country a measure of the value of the unoccupied product space where we take account of the distance between the country's current areas of comparative advantage and each potential product. We call this variable 'open forest'". Hausmann and Klinger, 2006, p.3

intention to produce imaginary industrialisation[26]. The following factors constitute the effective binding constraints:

- Government failure and Dutch disease

The main problem in Azerbaijan seems to be loss of competitiveness -- the Dutch disease -- in combination with government failure. Businesses do not invest and even existing ones leave the country due to excessively risky investment owing to poor contract enforcement, insecure rule of law, government ineffectiveness, and corruption. There is no obvious way to remove/reduce the weak government constraint. While there may be areas for possible improvement – democratic institutions, wages in the public sector, quality of education, etc. -- the fundamental reason for this state of affairs is deeply rooted and practically beyond reach.

- Low Levels of Human Capital Development

Although it may not be an evident binding constraint today for Azerbaijan, if the country is to succeed in accelerating balanced growth of its economy it is just a question of a short period of time to come up against a human capital constraint. Therefore, investment in education would be a must for the country.

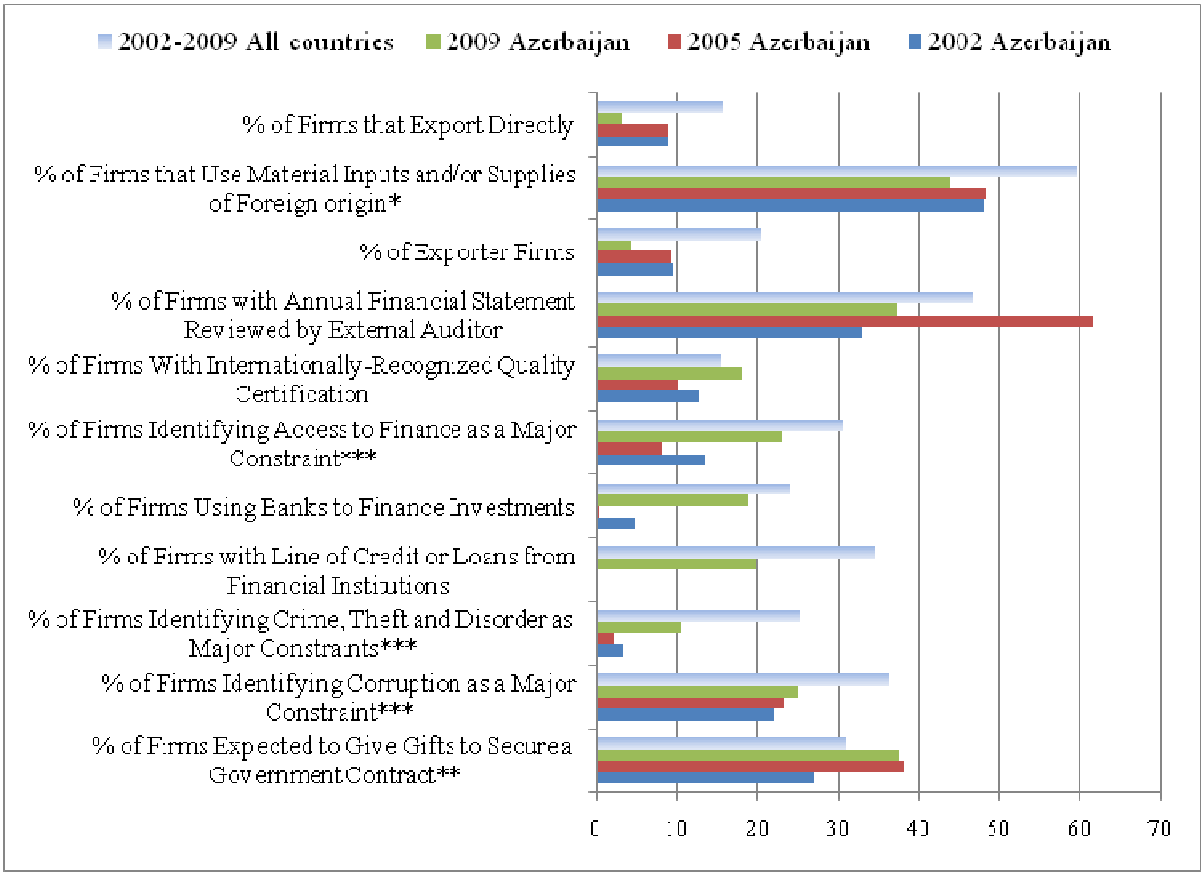
- Corruption and Poor Domestic Finance

The World Bank's *Investment Climate Surveys* (ICS), provides interesting information. The findings based on the ICS largely support our view. Tellingly finance does not get highest score as an obstacle to investment; more immediate obstacles are the main concern -- in fact

[26] This is to say that the established enterprises / sectors of industry are not subject to the market economy driving forces, e.g., competition, effective demand, profitability, innovation and effectiveness.

corruption turns out to be the single most important constraint on businesses; and with the passage of time (2002 to 2009) the measure has worsened (Figure 14 below).

Figure 14: Azerbaijan, investment climate survey



Kazakhstan

Kazakhstan is a huge country (ninth in the world) with a land area almost equal to the whole of Western Europe. Since its independence in 1991 from, the then dissolving, Soviet Union, Kazakhstan's economic system has experienced extreme fluctuations. The 1990s were an especially complex, and demanding period of transition for Kazakhstan. The country experienced extreme inflation of 3000 per cent in 1992, which stood above 1000 per cent for each one of the subsequent two years. Afterwards hyperinflation was brought under control after the introduction of a new

currency (the Tenge); meanwhile, partly as a consequence of the interruption of the established industrial relations that accompanied the break-up of the Soviet Union, real GDP fell to a low point of 61.4 per cent of its 1990 level in 1995. By 2008, the country's real GDP had reached 141 per cent of its pre-transition level of 1990 (CISSTAT, 2008).

Figure 15: Kazakhstan, consumer prices, annual increase, per cent

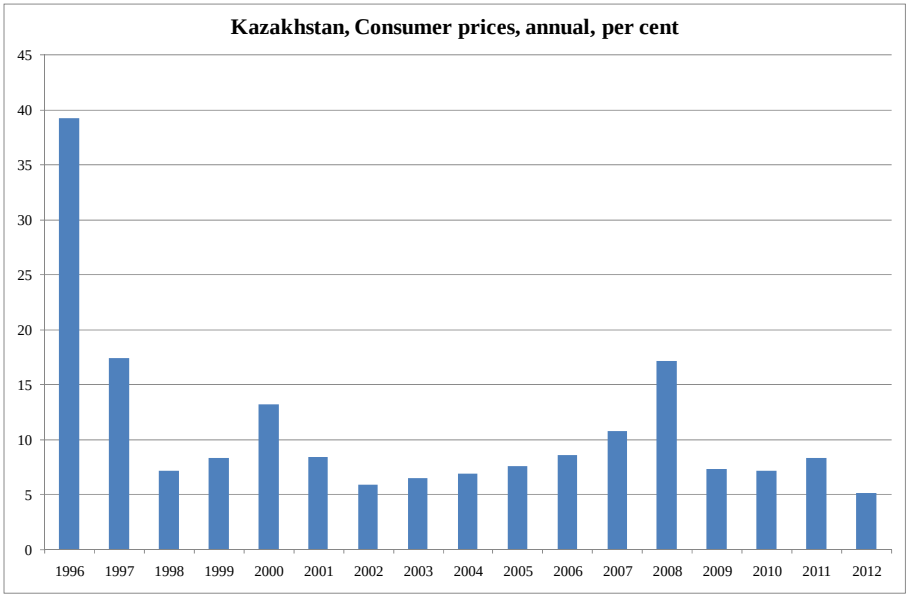
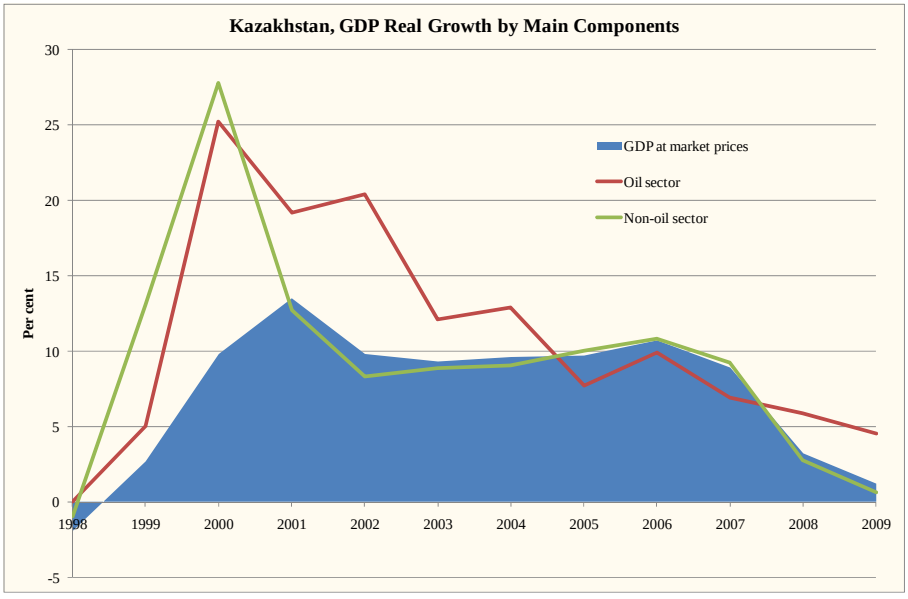


Figure 16: GDP real growth, by main components



Kazakhstan's growth performance in the past several years has been robust. A number of years of deep contraction in the early 1990s and slow expansion in the late 1990s, were followed by economic growth, which averaged above ten per cent over the period 2000 to 2007. Rising world prices and increased production of oil led to this high growth. Oil extraction has risen for the period 2000 and 2004, based on substantial foreign investment, by fifteen per cent on average. High growth rates are characteristic for resource abundant (former Soviet republics) countries; during the 2000-2009 period Azerbaijan expanded at even higher velocity, as well exporting mainly oil. Still, Kazakhstan is facing significant challenges -- unemployment, poverty, food security, corruption, mismanagement, decline of manufacturing, to mention but a few.

Manufacturing sector value added as per cent of GDP has declined by almost 6 percentage points over the period 2000 to 2012.

Figure 17: Manufacturing value added as per cent of GDP -- Kazakhstan and its peer group

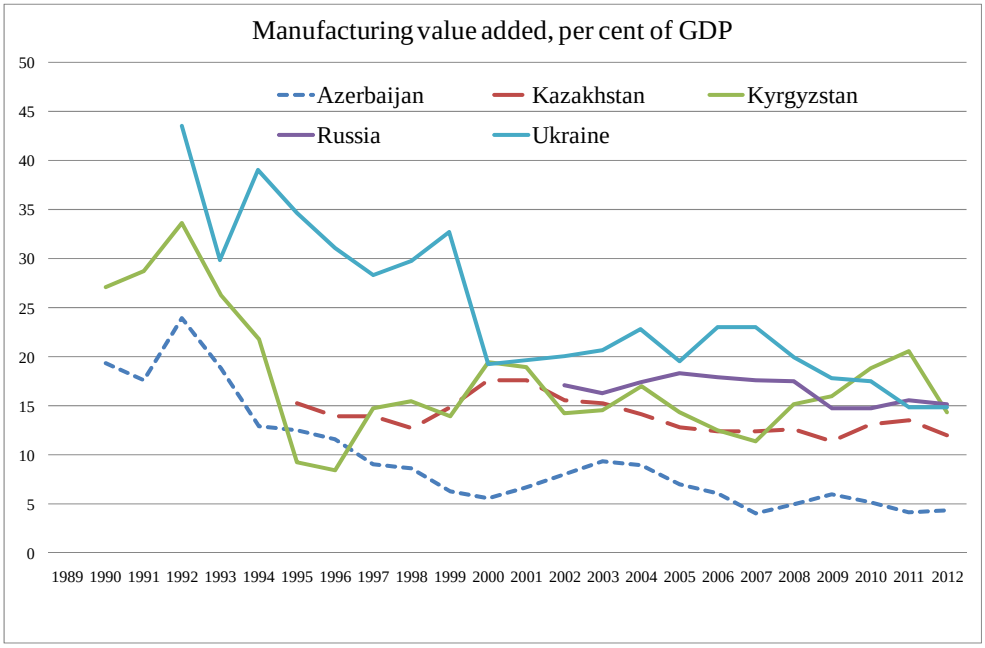
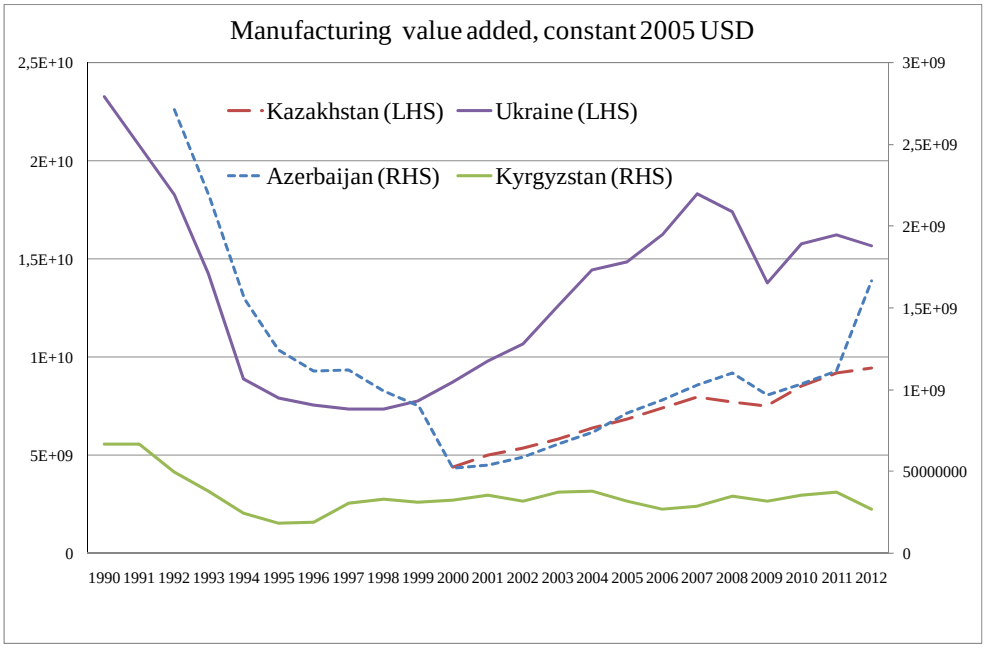


Figure 18: Manufacturing value added -- Kazakhstan and its peer group



Exchange rates developments in Kazakhstan

Figure 19: Nominal and Real Exchange Rates Development in Kazakhstan

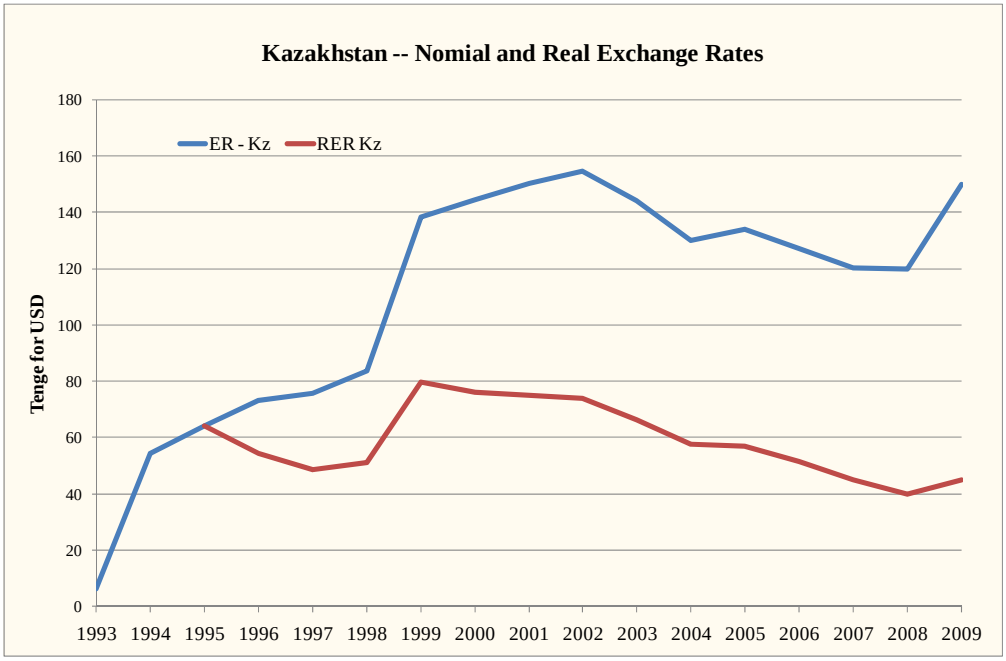


Table 9: Growth accounting Kazakhstan, 1997-2007

Table 1: Growth Accounting Kazakhstan											
	1997	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Quantity of Capital, million (tenge)	2 508 214	2 541 898	2 581 207	2 610 946	2 884 171	3 214 420	3 611 063	4 260 974	5 334 507	6 996 534	5 252 480
Consumption of fixed capital	253 957	238 760	286 949	420 520	498 159	576 877	666 015	822 513	1 049 146	1 422 361	1 744 054
Per cent of capital	*10.1*	*9.39*	*11.12*	*16.11*	*17.27*	*17.95*	*18.44*	*19.30*	*19.67*	*20.33*	*33.20*
Gross fixed capital formation	271 765	272 445	326 259	450 258	771 385	907 126	1 062 658	1 472 424	2 122 679	3 084 388	0
Per cent of capital	*10.84*	*10.72*	*12.64*	*17.25*	*26.75*	*28.22*	*29.43*	*34.56*	*39.79*	*44.08*	*0.00*
Real growth of capital, %					7.18	7.35	7.31	8.97	10.50	11.08	-14.52
Employment, growth %		-2.32	4.54	0.46	7.16	-1.54	3.76	1.57	-0.12	1.51	2.58
Gross Value Added, million	1 595 257	1 629 593	1 902 928	2 427 219	3 025 967	3 504 496	4 298 953	5 516 811	7 122 744	9 547 897	12 544 164
RGVA	1 595 257	1 541 715	1 588 977	1 726 378	1 954 807	2 137 811	2 347 757	2 595 054	2 841 789	3 135 277	3 566 383
Real growth contributions, %		-1.9	2.7	9.8	13.6	9.7	9.3	9.6	9.7	10.7	8.9
Capital percentage					**1.3**	**1.8**	**2.3**	**2.6**	**3.7**	**4.7**	**-6.3**
Labour percentage		**-1.9**	**4.1**	**0.4**	**5.8**	**-1.2**	**2.6**	**1.1**	**-0.1**	**0.9**	**1.5**
TFP percentage					**6.4**	**9.1**	**4.5**	**5.9**	**6.1**	**5.2**	**13.8**
1-α (capital share), %	0.28	0.18	0.10	0.15	0.19	0.24	0.31	0.29	0.35	0.42	0.44
Capital-output ratio (in real terms)	1.50	1.55	1.53	1.41	1.37	1.40	1.43	1.54	1.76	2.09	1.44
Compensation of employees	854 100	968 300	1 186 400	1 437 400	1 730 300	1 901 750	2 123 900	2 832 900	3 406 000	4 079 000	5 247 943
Labour share	0.54	0.59	0.62	0.59	0.57	0.54	0.49	0.51	0.48	0.43	0.42
Labour share adjusted for the imputed labour income of the self employed	0.72	0.82	0.90	0.85	0.81	0.76	0.69	0.71	0.65	0.58	0.56

Source: Author's own calculations based on national authorities' data, 2009.

Here we utilise again the growth accounting framework (see p. 17).

National accounts of Kazakhstan allocate to the compensation of employees 40 to 50 per cent of the GVA in the period from 1997 to 2007. These findings appear less counterintuitive than in case of Azerbaijan. The annual average growth rate of capital in Kazakhstan is significant (at 7.7 per cent), but not as high at the one in Azerbaijan. These calculations (above) manifest important developments in the observed macroeconomic indicators: TFP; capital; and, labour contribution to economic growth. It is clear that economic growth is again mainly driven by increase in the TFP.

Applying GDM we arrive at the conclusion that the following factors constitute the effective binding constraints: i) Government failure and Dutch disease; ii) Low Levels of Human Capital Development; and iii) Corruption and Poor Domestic Finance.

Kyrgyzstan

During the initial stages of its independence Kyrgyzstan has made more progress in reform ratification and implementation (EBRD, 1997) and less progress in economic development than any of the other Central Asian states. This may be largely due -- some may well claim -- to the fact that unlike its neighbours Kazakhstan and Uzbekistan, and the more distant fellows Tajikistan and Turkmenistan, Kyrgyzstan has no significant reserves of oil and gas. However, Kyrgyzstan is in third place by gold production within the CIS countries and 22nd in the world. Hence, an explanation better founded in reality appears to be the hectic privatisation, the eruption of corruption, severe mismanagement, and deficiency of markets. Still, strong and sustainable economic growth and secure political environment are yet to emerge.

Now we turn towards the EBRD transition indicators. The transition indicator marks – from 1 to 4 – are based on the result of the EBRD's Office of the Chief Economist informed judgement on the subject of the definite progress by country in transition. The scores are based on classification system initially developed in the 1994 Transition Report and refined and amended in subsequent reports.

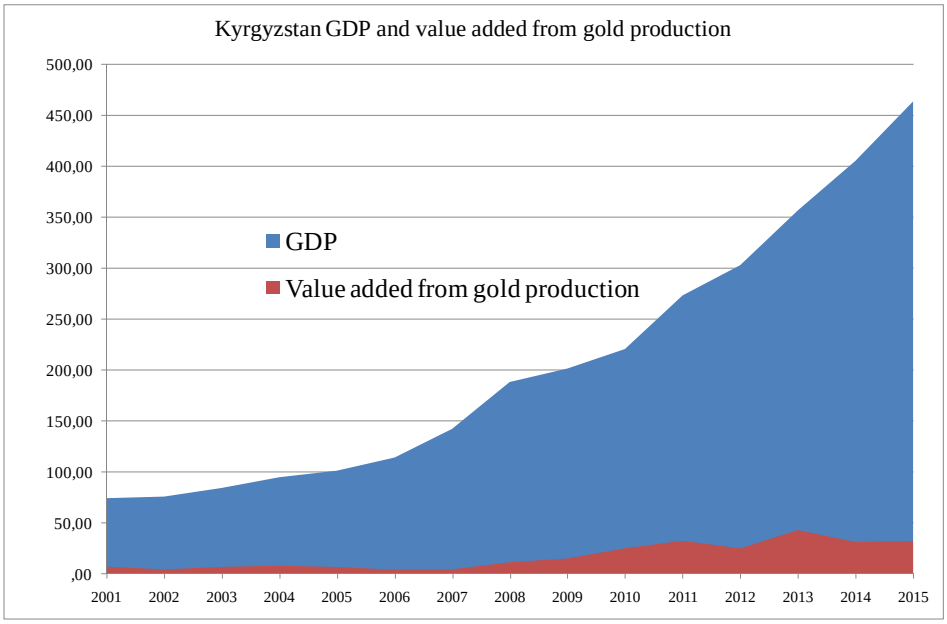
Table 10: Progress in transition in Central Asia

	Large scale privatization	Small-scale privatisation	Governance and restructuring	Price liberalisation	Trade and foreign exchabge system	Competition policy	Banking reform and interest rate liberalisation	Securities markets and non-bank financial institutions
Kazakhstan	3	3+	2	3	4	2	2+	2
Kyrgyzstan	3	4	2	3	4	2	3-	2
Tajikistan	2	2	1	3-	2	1	1	1
Turkmenistan	2	2	2-	2	1	1	1	1
Uzbekistan	3-	3	2	3-	2-	2	2-	2

Source: EBRD, Transition Report, 1997

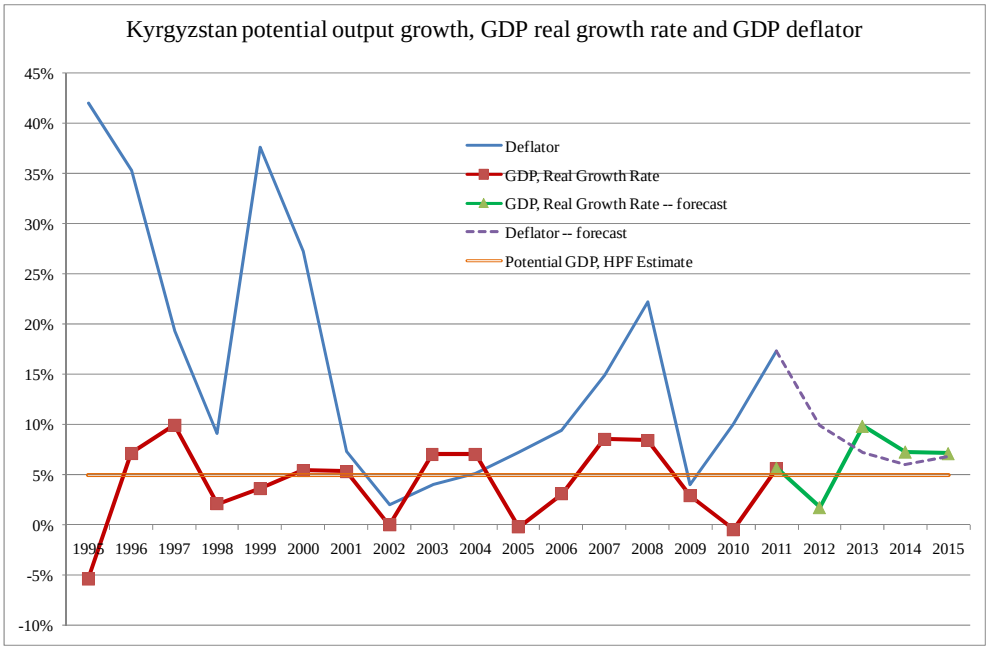
Note: "+" and "-" ratings are treated by adding 0.33 and subtracting 0.33 from the full value. Averages are obtained by rounding down, for example. a score of 2.6 is treated as 2+, but a score of 2.8 is treated as 3- (www.EBRD.com).

Figure 20: Kyrgyzstan, GDP and value added from gold production



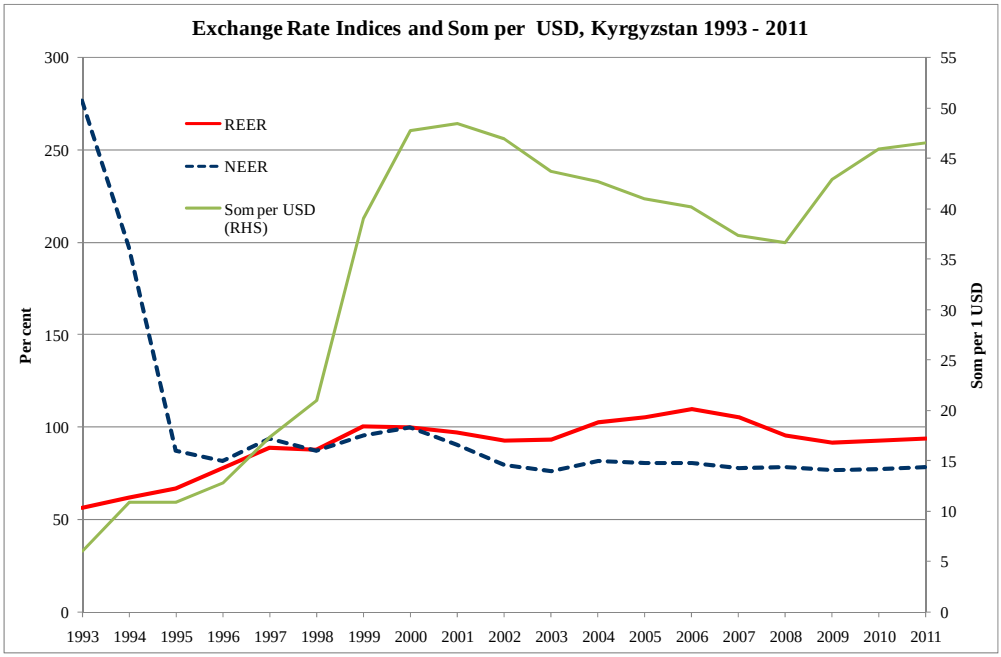
Source: National Statistical Committee of the Kyrgyz Republic, Ministry of Economic Regulation and author's estimations

Figure 21: Kyrgyzstan potential output growth, GDP real growth and GDP deflator



Source: National Statistical Committee of the Kyrgyz Republic, Ministry of Economic Regulation and author's estimations

Figure 22: Kyrgyzstan, exchange rates developments



Source: National Statistical Committee of the Kyrgyz Republic, Ministry of Economic Regulation and author's estimations

Balance of Payments of Kyrgyzstan -- Implications of Errors and Omissions

Here, we examine the size of potentially unreported income in Kyrgyzstan possibly underlying the persistently large net errors and omissions term of the balance of payments, which is generally with the same sign.

All economic transactions of a given economy with the rest of the world are summarised in the balance of payments. It consists of two major components: current account and capital and financial account. A residual, of the two is called net errors and omissions. By definition, the current account balance should be identical to the capital and financial account balance -- with the opposite sign -- equilibrating the balance of payments. However, various statistical problems and imperfections in the data collection lead to deviations from this theoretical rule. These deviations are contained in the error term. The size of this term is not an indicator of the relative precision of the data, since it represents a net amount whereby errors and omissions with opposite sign should mutually offset.

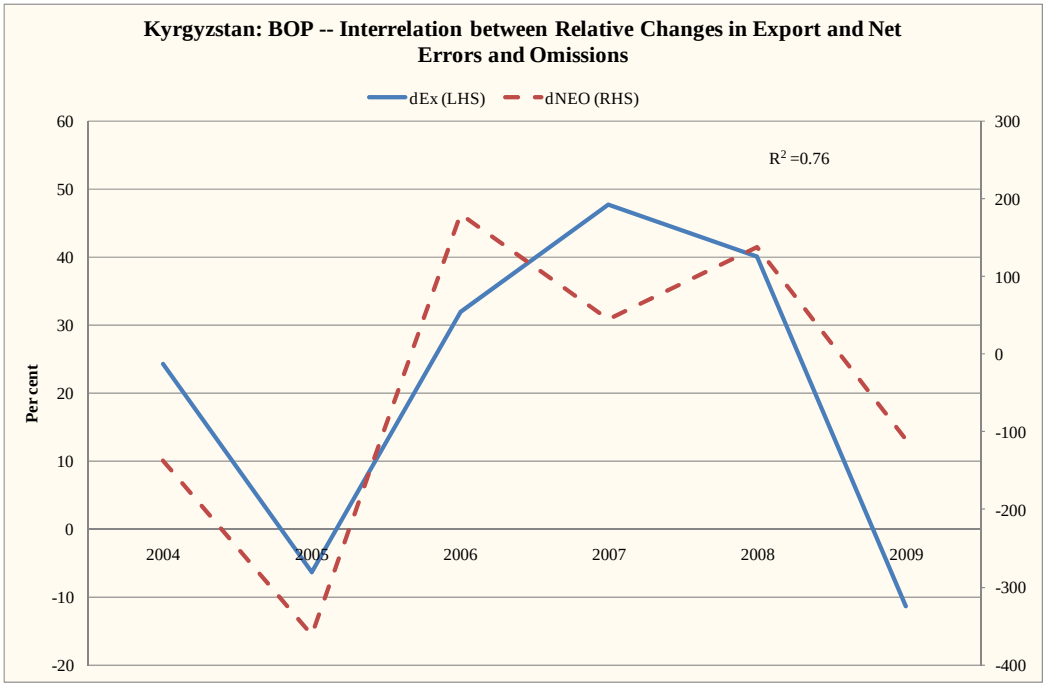
However, there is a reason for concern if the error term is persistently large and with the same sign. In general -- if this term is positive, it suggests that the sum of current and capital account balance is understated, and conversely for a negative error term. In Kyrgyzstan, there has been observed a persistently negative current account balance and a positive capital and financial account balance, with the absolute value of the current account deficit being commonly smaller than the capital and financial account surplus. The result is a positive annual amount of the net error term over the period 2003 to 2008 (with the exception of 2004).

The data reveal that the absolute value of the error term is around 700 million USD for the year 2008 -- the highest absolute value on record. Effectively, a consistently negative value is a sign

of a potential capital outflow; abroad or perhaps into the grey economy. For instance, positive current account balances signify the net inflow of funds into the economy. If, simultaneously the capital and financial account balance is zero, then we observe net capital inflow. In this case, the net error term will turn negative -- keeping the balance.

Figure 31, below, illustrates the very high correlation between the variables, relative change in export and relative change in the error term; correlation coefficient 0.76.

Figure 23: Kyrgyzstan BOP, relative change in export and net errors and omissions

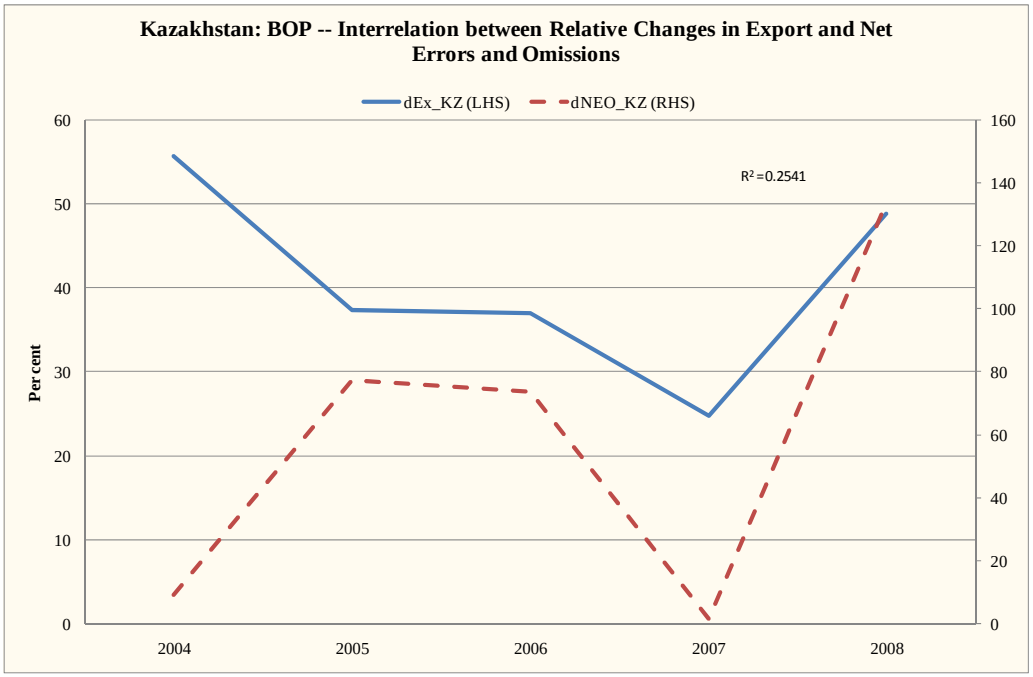


As the economic activities in Kyrgyzstan, reflected in the balance of payments data, have a strong regional component including strong potential importance of re-export, implying a very large amount of unrecorded accumulation of foreign cash from such eventual transactions. It seems likely that this accumulation is mainly linked to the shadow economy in trade, i.e. to

unreported – and therefore untaxed – income from foreign re-export. Though potentially some part of this unrecorded foreign cash accumulation ends up in the legal sector of the economy, these funds are not subject to direct but only to indirect taxes.

For comparison a chart with the same structure, for the neighbouring country of Kazakhstan is presented below. In this case the coefficient of correlation turns out to be much less important, just 0.25, which is consistent with the analysis for Kyrgyzstan.

Figure 24: Kazakhstan BOP, relative change in export and net errors and omissions



What Break-ups do to Countries?

Here we try to provide an answer to the interesting and important (to economics and beyond) question of what break-ups do to countries?

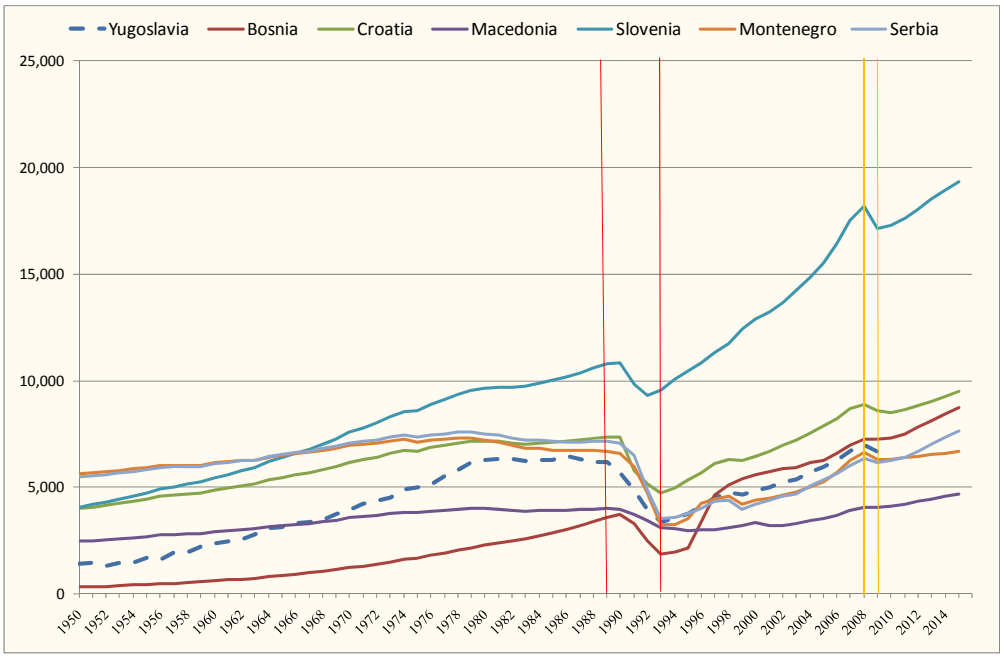
Hence, we concentrate our analysis on the Former Yugoslavia, the Former Soviet Union and their ex-republics and the respective successor's independent states; we look as well into the state of affairs in the former Czechoslovakia. As controls we employ Bulgaria, Poland, Hungary, and Romania.

The data -- GDP per Capita Estimates -- are obtained from James et al. (2012). The dataset covers the period 1950 to 2015, providing GDP per capita estimates expressed in either constant US dollar terms or international dollar terms from seven different sources.

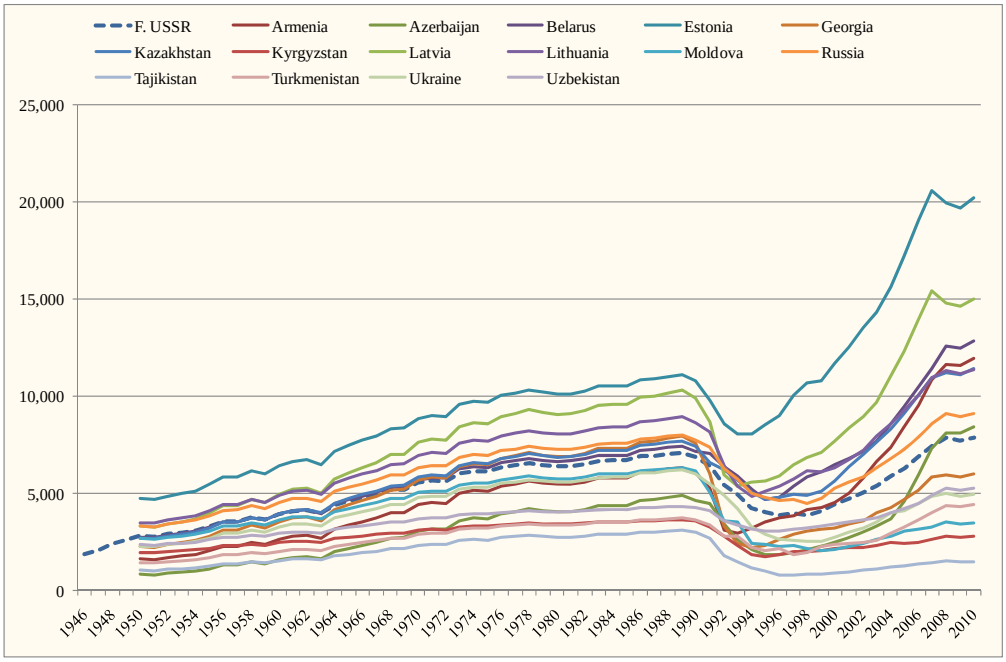
Endeavouring to track the "geometry" of the process of decommunisation we use a set of dummies, splitting the period from 1950 to 2012 onto three parts: i) socialist stage -- 1950 to 1988; ii) transition phase – 1989 to 1993; and, iii) 1994 to present (2012) -- building the structure of the new states. Initial, preliminary estimates are provided below.

Figure 25: GDP per Capita, 1990 Geary-Khamis (GK) USD: a) Former Yugoslavia and its Republics; and, b) Former USSR and its Republics

a)



b)



Note: The Geary-Khamis is an aggregation method in which category "international prices" (reflecting relative category values) and country purchasing power parities (PPPs), (depicting relative country price levels) are estimated simultaneously from a system of linear equations. Has the property of base-country invariance, matrix consistency and transitivity (https://stats.oecd.org/glossary/detail).

We use the following notation:

YUGO: GDP per capita, Former Yugoslavia,

BOSNIA: GDP per capita, Bosnia and Herzegovina,

CROAT: GDP per capita, Croatia,

MACE: GDP per capita, Macedonia,

SLOV: GDP per capita, Slovenia,

MONT: GDP per capita, Montenegro

SERBIA: GDP per capita Serbia

INPT: Constant

T1: Dummy = 1 for 1950 to 1988; 0 otherwise

T2: Dummy = 1 for 1989 to 1993; 0 otherwise

T3: Dummy = 1 for 1994 to 2012; 0 otherwise

PI: Percentage rate of change

In what follows we use GDP per capita, 1990 Int. GK USD, Maddison, A. (one of the 7 data sources available), the exercise could be repeated applying the other datasets.

Table 11: Ordinary Least Squares Estimates Former Yugoslavia – in levels

Dependent variable	INPT	T2	T3	$\overline{R}^2$
YUGO	3985.9 (15.4010)	497.6 (.57970)	1352 (2.8530)	0,092997
BOSNIA	1443.3 (7.4224)	1391.2 (2.1572)	4282.7 (12.4984)	0,71324
CROAT	5909.6 (31.5754)	-164.3503 (0.2747)	1344.3 (4.0761)	0,20071
MACE	3394.1 (42.1693)	165,6392 0.62196)	111.9155 (0.79093)	-0,018572
SLOV	7402.5 (20.1470)	2495.7 (2.0480)	6986.8 (10.7910)	0,6487
MONT	6584.3 (53.2718)	-1443.6 ('-3.5215)	-1487.7 ('-6.8303)	0,44818
SERBIA	6713.6 (49.1865)	-1216.0 ('-2.6861)	-1667.2 (-6.9317)	0.43824

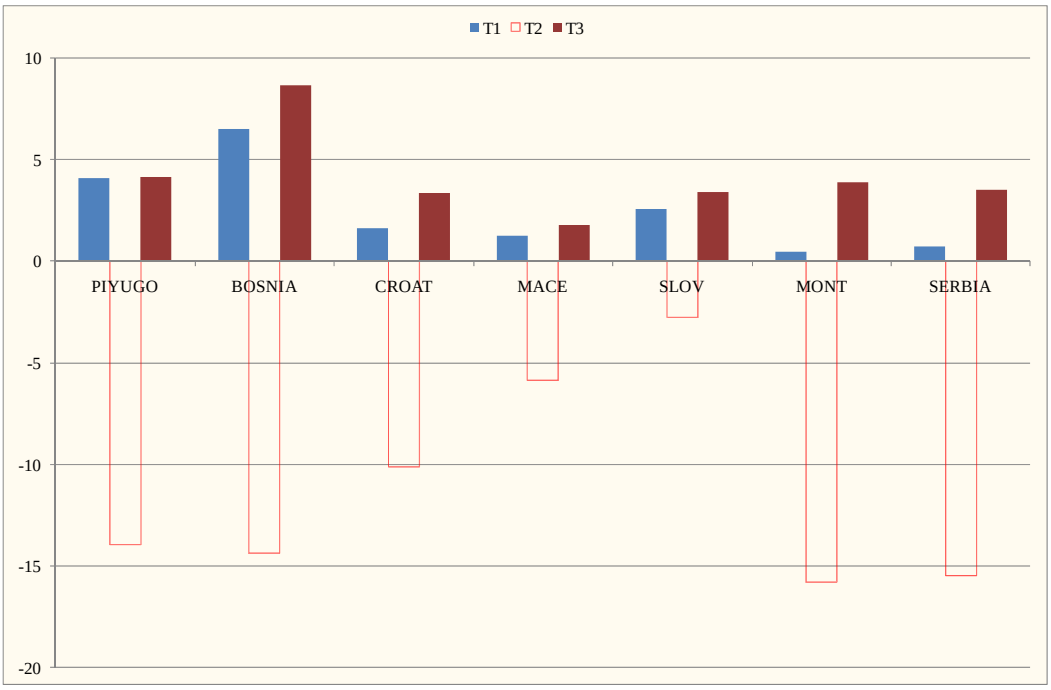
It is important to note that: 1) One dummy is omitted; given that a constant term is present, we need to avoid perfect collinearity (the dummy variable trap); 2) T-ratios in parentheses. (Kosovo is omitted on two grounds as it declared independence in 2008 and there is not sufficient data for the intended comparisons. Bosnia and Herzegovina (BiH) regressions may need to be re-estimated with differently structured dummies as BiH gained independence later in 1995. For consistency we use uniformly T1, T2, and T3); 3) Most coefficients are statistically significant – their interpretation is: the average GDP per capita over the 1950 to 1989 period is accounted for by the constant (INPT). It equals 7402.5 for Slovenia for this period, we need to add the 2495.7 (T2 coefficient) to get the average GDP per capita figure for the second (T2) period. Similarly, adding the T3 coefficient to the INPT will produce the average GDP per capita for the last (T3) period, e.g., 14389.0

Table 12: Ordinary Least Squares Estimates Former Yugoslavia – growth rates

Dependent variable	T1	T2	T3	$\overline{R}^2$
PIYUGO	4.0833 (5.0701)	-13.9624 (-5.6247)	4.1455 (3.4428)	0.44702
PIBOSNIA	6.5046 (4.6306)	-14.3996 (-3.3259)	8.6426 (4.3506)	0.26225
PICROAT	1.6068 (3.6898)	-10.0967 (7.5222)	3.3698 (5.4716)	0.57307
PIMACE	1.2739 (4.0304)	-5.8704 (6.0259)	1.7674 (3.9539)	0.45801
PISLOV	2.5552 (7.4513)	-2.7933 (2.6428)	3.4286 (7.0698)	0.30297
PIMONT	0.47232 (0.63946)	-15.8111 (6.9451)	3.8545 (3.6901)	0.49452
PISERBIA	0.72234 (1.1656)	-15.4668 (8.0972)	3.5141 (4.0096)	0.56697

The results suggest that after a significant, though relatively short lived decline (about 5 years on average) in the GDP per Capita growth rate during the transition period (T2, in our notation) all the constituent countries have experienced noteworthy advancement in their GDP growth per Capita rates during the last most recent period (1994 to 2012). It should be noted that due to the unusual effect of the Financial and Economic Crises (Great Depression Mark II) starting in 2008 the trend growth rates are underestimated. Restricting our sample to the year 2008 produces clearly higher post-communist period growth rates, but we stick to our conservative, results.

Figure 26: Estimated GDP per Capita Trend Growth Rates (Former Yugoslavia)



Next we apply the same apporch to the Former USSR ex-republics estimating T1, T2, and T3, both in terms of levels and in terms of growth rates.

We use the following notation:

AZE: GDP per capita, Azerbaijan,

BLR: GDP per capita, Belarus,

EST: GDP per capita, Estonia,

GEO: GDP per capita, Georgia,

KAZ: GDP per capita, Kazakhstan,

KGZ: GDP per capita, Kyrgyzstan,

LTU: GDP per capita, Lithuania,

LVA: GDP per capita, Latvia,

MDA: GDP per capita, Moldova,

RUS: GDP per capita, Russia,

TJK: GDP per capita, Tajikistan,

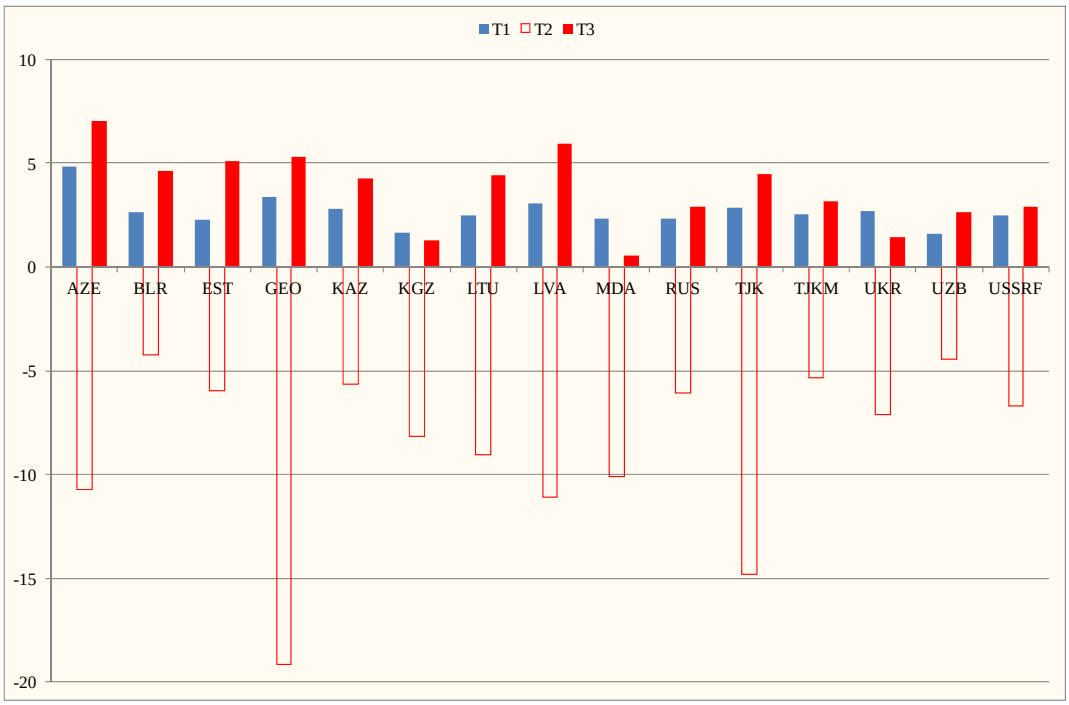
TJKM: GDP per capita, Tjurkmenistan,

UKR: GDP per capita, Ukraine,

UZB: GDP per capita, Uzbekistan,

USSRF: GDP per capita, USSRF, and obtain the results depicted at Figure 28, below (for details please see Annex 1, Table 43 and Table 44).

Figure 27: GDP per Capita Trend Growth Rates, Former Soviet Union and Its Republics



The severe economic decline depicted by "T2" (the transition recession of 1989-1993) is clerly evident ranging from around minus 4% for Belarus to around minus 20% for Georgia.

It is worth mentioning in passing the case of the of Czechoslovakia's disintegration where no obvious changes were observed and both (new) countries the Czech Republic and Slovakia continued their development on a very similar (rather high growth) path.

Figure 28: Czechoslovakia, Czech Republic, Slovakia

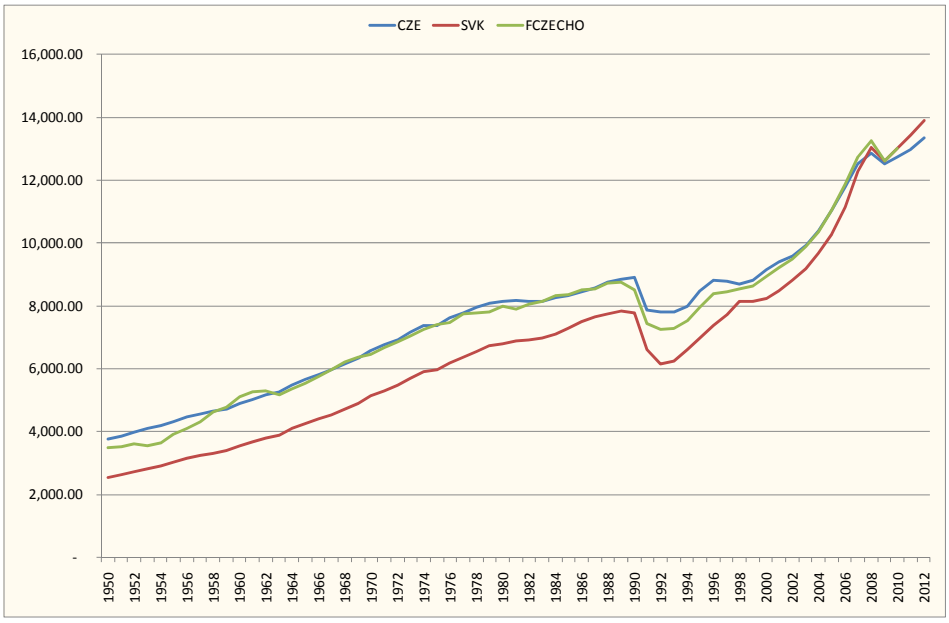


Table 13: Ordinary Least Squares Estimates Former Czechoslovakia – in levels

Dependent variable	INPT	T2	T3	$\overline{R}^2$
CZE	6331.4 (23.9446)	1917.0 (2.4439)	4184.3 (9.0571)	0.56502
SVK	5020.1 (16.5659)	1904.0 (2.1180)	4926.8 (9.3054)	0.57736
FCZECHO	6291.4 (22.8171)	1559.8 (1.9290)	3817.9 (7.6981)	0.49352

Table 14: Ordinary Least Squares Estimates Former Czechoslovakia – growth rates

Dependent variable	T1	T2	T3	$\overline{R}^2$
PICZE	2.2421 (6.3854)	-2.1111 ('-2.1809)	2.8880 (5.8158)	0.24323
PISVK	2.9791 (7.0554)	-4.0068 ('-3.4421)	4.3361 (7.2615)	0.38989
PIFCZECHO	2.4489 (5.5323)	-3.3895 ('-2.7776)	3.5173 (5.3146)	0.28245

We continue by examining the countries which we have selected to serve as our controls. These countries -- Bulgaria, Hungary, Poland and Romania – have beagn and are undergoing very similar process of transition, but remained intact, keeping there borders unchanged. Figure 29 shows the in general general signifivntly longer transition recession (rangeing from 1989 to 1997).

Figure 29: Bulgaria, Hungary, Poland, and Romania

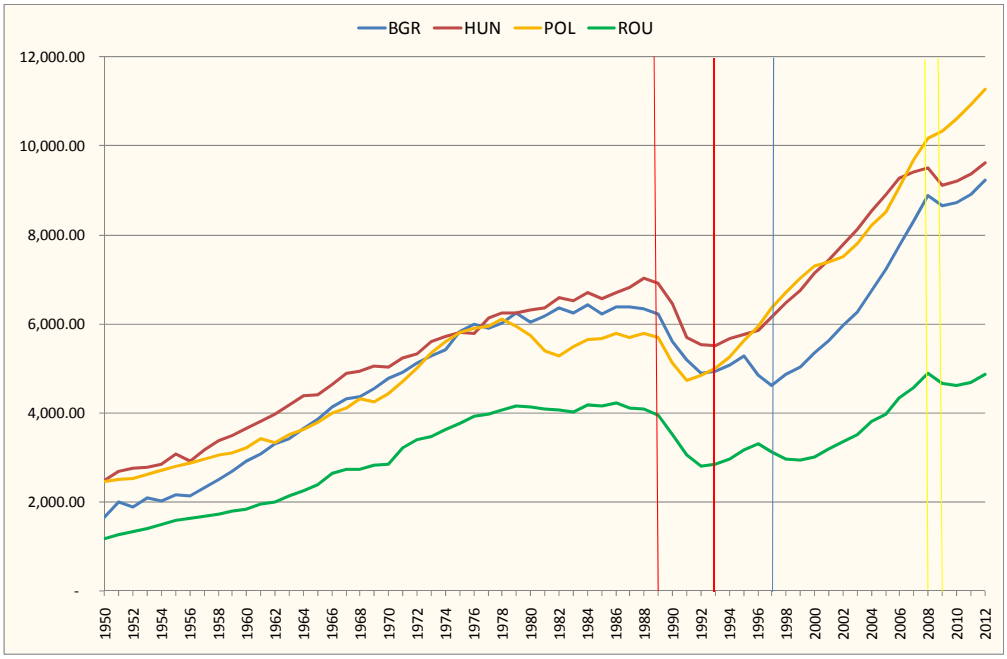


Table 15: Ordinary Least Squares Estimates Control Countries – in levels

Dependent variable	INPT	T2	T3	$\overline{R}^2$
BGR	4385.9 (16.8832)	978.9891 (1.2704)	2318.4 (5.1080)	0.28054
HUN	4877.3 (21.7470)	1141.0 (1.7150)	3026.0 (7.7225)	0.48199
POL	4369.5 (18.8933)	708.1668 (1.0322)	3827.1 (9.4712)	0.58766
ROM	2874.3 (18.6834)	356.6422 (0.78148)	911.5308 (3.3913)	0.13308

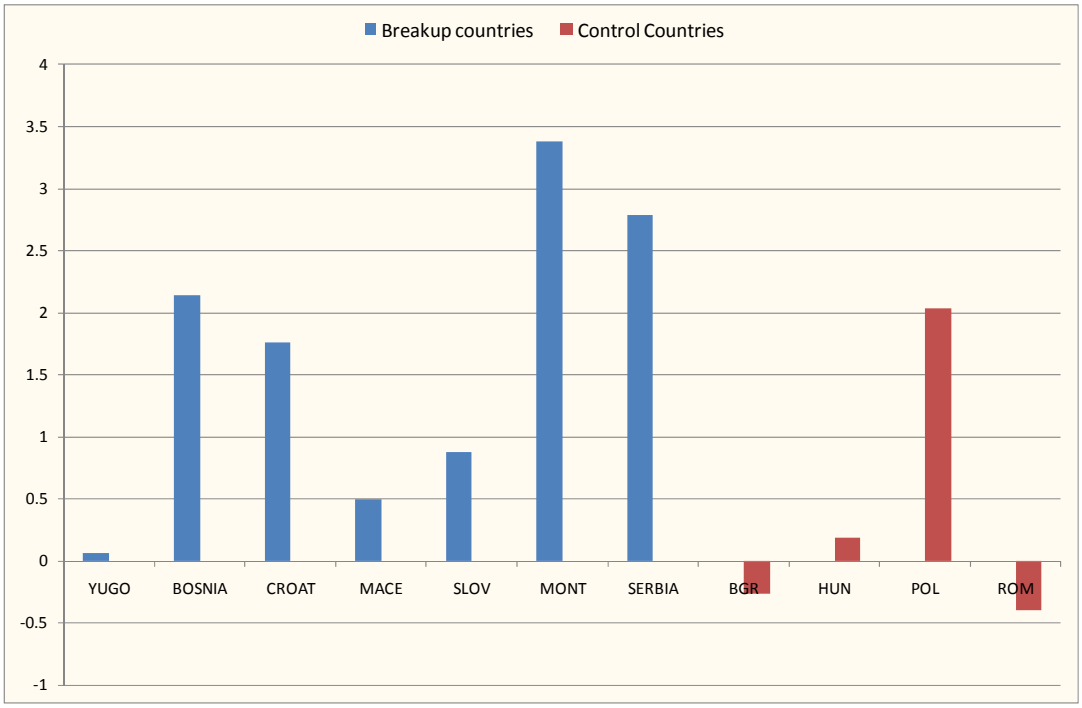
Table 16: Ordinary Least Squares Estimates Control Countries – growth rates

Dependent variable	T1	T2	T3	$\overline{R}^2$
PIBGR	3.7030 (4.9918)	-4.8047 ('-2.3494)	3.4384 (3.2776)	0.18259
PIHUN	2.8215 (5.9669)	-4.6786 ('-3.5891)	3.0045 (4.4929)	0.32207
PIPOL	2.3370 (4.7612)	-2.7037 ('-1.9980)	4.3761 (6.3043)	0.24861
PIROM	3.3649 (5.3875)	-6.8514 ('-3.9791)	2.9630 (3.3545)	0.32716

On this basis we canmake a number of preliminary observations: the breakup countries experienced deeper and generally shorter economic crisis (initial transition period) in comparison with the control countries (Bulgaria, Hungary, Poland and Romania). However, they have tended to grow afterwards predominantly faster and have managed to add, on average, similar or higher amount (in 1990 international GK USD per capita) than the control countries. Furthermore, the evidence shows that when rich countries leave the former union they grow and develop much faster, e.g., Slovenia, Estonia, Latvia, and Lithuania.

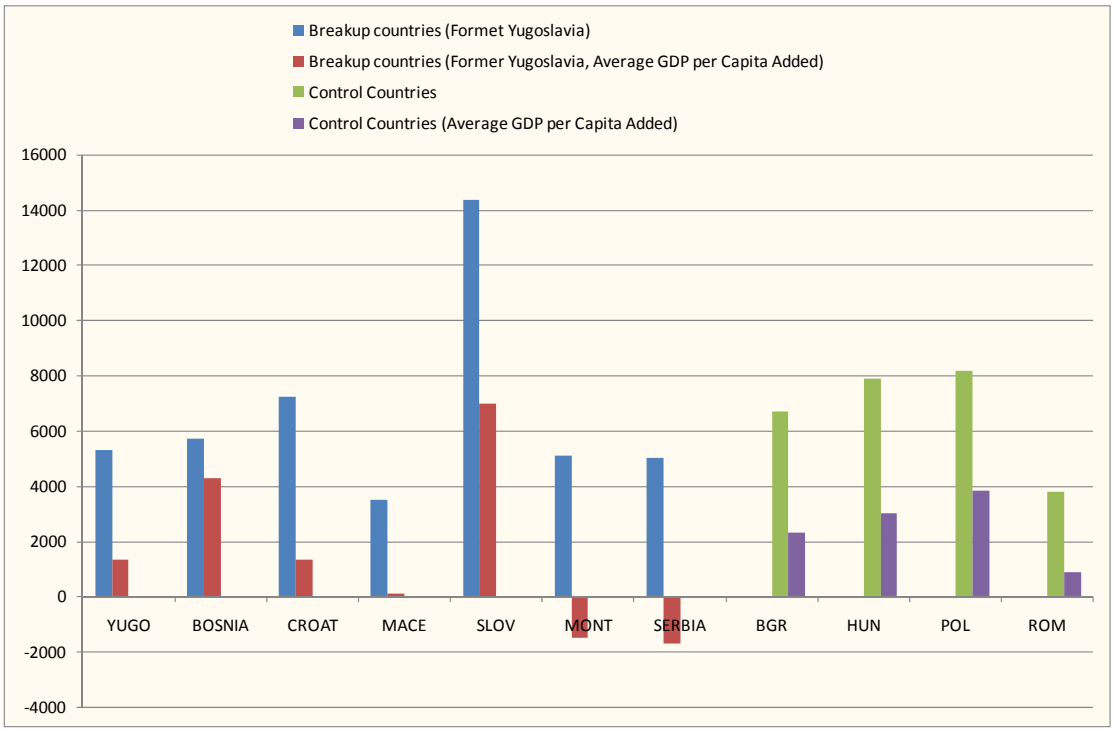
Figure 30: Growth Rate Difference, T3-T1 period; a) Former Yugoslavia versus control countire; b) Former USSR versus control countires

a)



b)

Figure 31: Average level of GDP per capita after the period of transition (1994-2012)



The economic and political costs and benefits of secession are strongly debatable and controversial. Our contribution consist in taking direct empirical account of the process of economic development of the countries that have disintegrated on the brink of the Iron Curtain fall – Yugoslavia, USSR, and Czechoslovakia.

From this perspective the process of secession is apparently leading to a relatively higher level of economic growth in a medium-term. However, the empirical evidence is limited and various other factors would need to be taken into account including the adaptation / alteration of the economic and political relations of the newly independent countries to the rest of the world. For example various countries of our sample become members of EU, CIS, Eastern partnership, etc., hence experiencing the effects of greater economic integration and greater factor mobility affecting directly the pattern of their economic development

Former Centrally Planned Economies Convergence Club?

Introduction

Currently there is a strong revival in interest in both the theoretical and the practical aspects of the processes of economic growth, and the factors determining countries' income levels. The fast growing literature identifies a range of ways through which convergence or divergence may occur. Relatively recently the research has extended to a more comprehensive examination of the potential causes determining the growth of income per capita including: cultural; historic; geographical; natural endowments; and institutional factors. While there is a lot of research to be done into the subtleties of the above mentioned broad factors, various (important, though not unanimously accepted) suppositions have been produced by the literature so far. The modern intensive development in this area started with Baumol (1986), about 30 years ago, when he apparently found evidence of absolute or conditional convergence (in line with the neoclassical economics tradition) -- depending on the interpretation -- among 16 OECD countries. However, his elucidations were very tentative, introducing the idea of "convergence clubs" and emphasizing the importance of the "path dependent processes" whereby the final outcome of a process is not just a unique equilibrium, but depends on the initial conditions and the random events on the path of development (a rather different approach from neoclassical economics). On this basis, Barro (1991), Sala-i-Martin (1994) and Barro and Sala-i-Martin (1995) went further and are popularly credited with "a mnemonic rule: *economies converge at a speed of about two percent per year* (Sala-i-Martin1994)." On theoretical (and empirical) grounds Sala-i-Martin was not able to "distinguish the neoclassical hypothesis of

diminishing returns to capital from the hypothesis of positive (but slow) rates of technological diffusion".

There are important disputes stemming from the empirics of economic convergence to wider economics and policy issues. In an influential paper Sachs and Warner (1995) articulate Dutch disease features by documenting "[a] statistically significant, inverse and robust association between natural resource intensity and growth over the past twenty years." Conversely, Mehlum et al. (2006) claim that they "[h]ave shown that the quality of institutions determines whether countries avoid the resource curse or not. The combination of grabber friendly institutions and resource abundance leads to low growth. Producer friendly institutions, however, help countries to take full advantage of their natural resources." Beckmann et al (2014) further extend the connection between the institutional framework and government activities by arguing that "[t]he institutional framework has to be included in any analysis of the impact of government activity on economic growth. [...] the impact of overall government activity on growth is conditional on the quality of the institutions and differs between clusters of countries characterized by different economic systems."

Moreno and Trehan (1997) emphasize the importance of location for economic activity and growth. Using a sample of ninety-three countries over the period of 1965 to 1989 they "[c]ould not find evidence that the level of income (per worker) in a region matters. In other words, a country's per-worker income does not appear to converge to those of other countries in the region. However, proximity to large markets does matter, as countries that are near large markets appear to have grown faster." Moving beyond location Spolaore and Wacziarg (2013) focus their analysis on historic roots, culture and genetic and epigenetic transmission. They provide an excellent review of the relevant literature and present several important conclusions and suggestive answers to pertinent

questions: i) “[t]echnology and productivity tend to be highly persistent even at very long horizons; ii) “[l]ong-term persistence holds at the level of populations rather than locations”; iii) “[l]ong-term genealogical links across populations play an important role in explaining the transmission of technological and institutional knowledge and the diffusion of economic development; iv) “If current development is a function of a very long-term historical factors, are development policies hopeless? Not necessarily”

Desmet et al (2011) are the first to quantitatively analyze what determines the likelihood of secessions and unions of nations. Finally, another important contribution questions directly the relevance of the apparatus of the β and σ -- convergence[27]. Quah (1995) “[c]onclude that, as with β -convergence, the empirics of σ -convergence cannot deliver, even in theory, a useful convincing answer. For convergence one is interested in how one part of the distribution behaves relatively to another: that is, after all, what “catch-up” means”. Applying his arguably better suited techniques (stochastic kernel) his key finding is that ”[t]he rich are becoming richer; the poor, poorer; with the middle-class vanishing.”

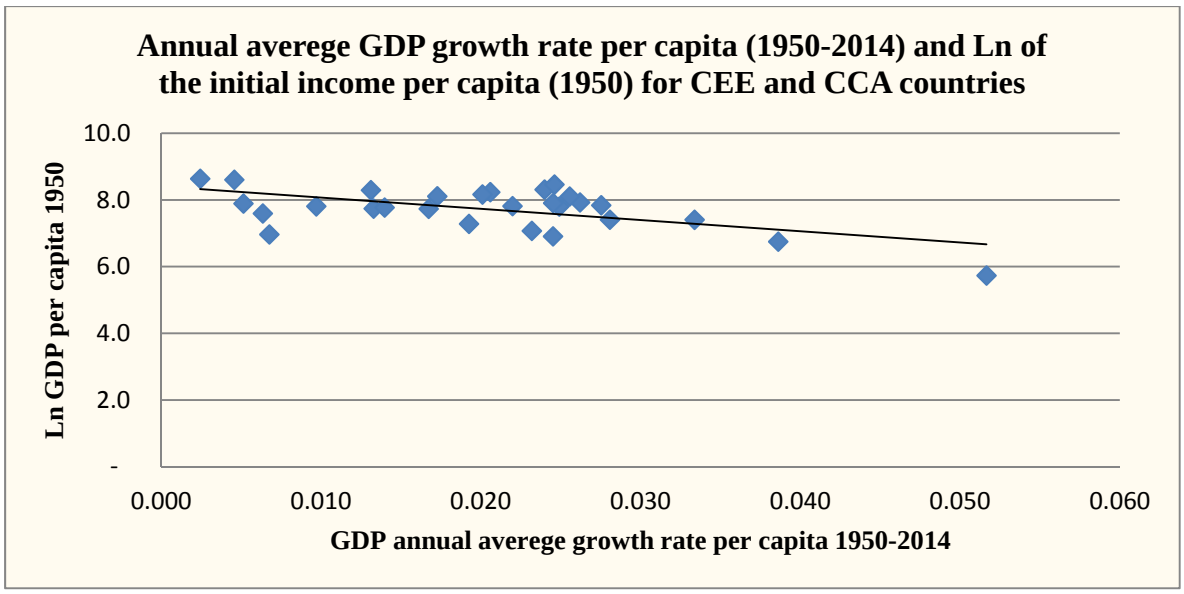
Most of the existing literature is focused on large samples of diverse countries or subsamples (clubs) of the rich industrialised economies (OECD). Our study is the first to explore the convergence hypothesis in the setting of the 28 (former centrally planned) economies covering the CEE and CCA countries. We use both a cross-section and a panel approach in examining evidence about convergence.

[27] σ -- convergence signifies reduction in the dispersion of levels of income across economies; β -- convergence means that poor economies grow faster

Methodology and econometric estimates

The scatter diagram below depicts the interrelation between the annual average growth rate per capita (1950-2014) and the Ln of the initial income per capita for the former centrally planned economies. On observation it is obviously negative.

Figure 32: Annual average GDP growth rate per capita (1950-2014) and Ln of the initial income per capita (1950) for CEE and CCA countries



Source: James et al. *Population Health Metrics* 2012, Maddison time-series in International GK Dollars

To investigate further, we apply the following general model:

eq. 7 $$\left(\frac{1}{T}\right)Ln\left(\frac{Y_{i,T}}{Y_{i,0}}\right) = \alpha_i + \beta LnY_{i,o} + \gamma X_{i,0} + \varepsilon_{i,t}$$

This model represents an expansion of Solow's growth equation which relates GDP per capita growth rates nonlinearly to Ln of initial level of GDP per capita $LnY_{i.o}$ and also includes the control (explanatory) variables term $X_{i,0}$, and $\varepsilon_{i,t}$ is normally distributed $(0,\sigma)$.

T – Time period

$Y_{i,0}$ –Initial level of GDP per capita

$Y_{i,T}$ – GDP per capita growth rates

$X_{i,0}$ – Control explanatory variables

We estimate four different models, both in conditional and unconditional forms.

First we run a cross-section regression on growth -- using 65 year averages (1950-2014) for the 28 (CEE and CCA) countries; Assuming constant initial state and growth level of the technology across countries we estimate the following equation:

eq. 8 GDPAG = α INPT + β LGDP50 + ε

and obtain the following results:

Dependent Variable: GDPAG
Method: Least Squares
Date: 09/08/14 Time: 10:54
Sample: 1 28
Included observations: **28**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INPT	0.098447	0.021392	4.602104	0.0001
LGDP50	**-0.010116**	0.002760	**-3.665237**	0.0011

R-squared	0.340670	Mean dependent var	0.020291
Adjusted R-squared	**0.315311**	S.D. dependent var	0.010912
S.E. of regression	**0.009029**	Akaike info criterion	-6.507935
Sum squared resid	0.002120	Schwarz criterion	-6.412778
Log likelihood	93.11109	Hannan-Quinn criter.	-6.478845
Durbin-Watson stat	1.118720		

or substituting coefficients:

eq. 9 GDPAG = 0.0984*INPT - 0.0101*LGDP50

Where,

GDPAG – Annual average GDP growth rate per capita 1950-2014

INPT – Intercept (constant)

LGDP50 – Ln GDP per capita 1950

The coefficient (β) in front of the variable Ln of the initial GDP per capita in 1950 is negative and significantly different from zero (-0.0101) this provides evidence of absolute convergence; this is to say that poor economies tend to grow faster than rich ones.

Using the (re-parameterised) relation between the speed of convergence (decay rate) λ [28] and the estimated coefficient β

[28] Nuclear physics: "Decay constant, proportionality between the size of a population of radioactive atoms and the rate at which the population decreases because of radioactive decay. Suppose N is the size of a population of radioactive atoms at a given time t, and dN is the amount by which the population decreases in time dt; then the rate of change is

eq. 10 $$\beta = -(1 - e^{\lambda\tau})$$

eq. 11 $$\lambda = -\frac{Ln(1+\tau\beta)}{\tau}$$

we estimate speed of convergence of 0.016 or about 1.6 per cent per year, which would imply a half-life of convergence to steady state of about 68 years. This brings us to the issue of statistical versus substantive (economic) significance. For instance, our findings are not not-inconsistent with the results of a seminal paper by Barro (1991), corroborated by another influential paper by Alesina *et al* (1996). These authors report β coefficients of conditional convergence for 98 countries for the period 1960-85, with sizes twice as low as the estimate presented above, though they do not dwell too much on the consequential effect on the half-life to their respective steady states.

But differences across countries must have certain (important) effects on the dependent variable GDPAG. Hence, we add control variables on the right-hand side of our model by including distance and resource abundance.

eq. 12 $$GDPAG = \alpha\, INPT + \beta\, LGDP50 + \gamma\, DISTANCE + \delta\, RESOURCE + \varepsilon$$

obtaining the following results:

---

given by the equation $dN/dt = -\lambda N$, where λ is the decay constant. Integration of this equation yields $N = N_0\, e^{-\lambda t}$, where N_0 is the size of an initial population of radioactive atoms at time $t = 0$. This shows that the population decays exponentially at a rate that depends on the decay constant. The time required for half of the original population of radioactive atoms to decay is called the half-life. The relationship between the half-life, $T_{1/2}$, and the decay constant is given by $T_{1/} = 0.693/\lambda$ (http://www.britannica.com/science/decay-constant)."

Dependent Variable: GDPAG
Method: Least Squares
Date: 08/30/14 Time: 20:29
Sample: 1 28
Included observations: 28

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INPT	0.210614	0.028902	7.287297	0.0000
LGDP50	**-0.014846**	0.002317	**-6.406497**	0.0000
DISTANCE	**-0.010659**	0.002258	**-4.720832**	0.0001
RESOURCE	**0.010310**	0.003895	**2.647037**	0.0141

R-squared	0.658801	Mean dependent var	0.020291
Adjusted R-squared	**0.616151**	S.D. dependent var	0.010912
S.E. of regression	**0.006761**	Akaike info criterion	-7.023837
Sum squared resid	0.001097	Schwarz criterion	-6.833522
Log likelihood	102.3337	Hannan-Quinn criter.	-6.965656
Durbin-Watson stat	1.014617		

or substituting coefficients:

eq. 13 GDPAG = 0.2106 - 0.0148*LGDP50 - 0.0106*DISTANCE + 0.01030*RESOURCE

Where,

GDPAG – Annual average GDP growth rate per capita 1950-2014

INPT – intercept (constant)

LGDP50 – Ln GDP per capita 1950

DISTANCE -- Distance to Berlin or Stockholm, whichever is the nearer

RESOURCE – Resource abundance dummy

As the coefficient (β) in front of the variable Ln of the initial GDP per capita in 1950 is negative and significantly different from zero (-0.0148) it would imply β – (conditional) convergence; this is to say that poor economies tend to grow faster than rich ones, *ceteris paribus* (holding constant the

proxies for the respective steady states). Furthermore, higher economic growth is associated with a shorter distance to Berlin or Stockholm and higher resource abundance.

The speed of convergence is estimated at 0.051 or 5.1 per cent, which would imply a half-life of convergence to steady state of around 46 years.

ii) Next we estimate stacked by date panel for two (13 years averages) periods (1989-2001 and 2002-2014)

eq. 14 $\text{GDPAG} = \alpha + \beta \text{LGDPI} + \varepsilon$

and obtain the following results:

Dependent Variable: GDPAG
Method: Panel Least Squares
Date: 09/09/14 Time: 12:06
Sample: 2001 2002
Periods included: 2
Cross-sections included: 28
Total panel (balanced) observations: 56

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	**0.098765**	0.093334	**1.058194**	0.2947
LGDPI	**-0.010175**	0.010822	**-0.940189**	0.3513

R-squared	0.016106	Mean dependent var	0.011163
Adjusted R-squared	-0.002114	S.D. dependent var	0.040626
S.E. of regression	0.040669	Akaike info criterion	-3.531642
Sum squared resid	0.089314	Schwarz criterion	-3.459308
Log likelihood	100.8860	Hannan-Quinn criter.	-3.503599
F-statistic	0.883956	Durbin-Watson stat	3.004797
Prob(F-statistic)	0.351307		

Substituting coefficients:

eq. 15 GDPAG = 0.0987 - 0.0101*LGDPI

Where,

GDPAG – Annual average GDP growth rate per capita for the two periods stacked panel data

C – Constant (intercept)

LGDPI – Ln of the initial GDP per capita for the first year of the respective periods

The coefficient β is with negative sign (as expected) but turns out to be insignificant. Hence, we continue by adding relevant control variables and estimate the respective equation 16:

$$\text{eq. 16} \quad GDPAG = \alpha + \beta LGDPI + \gamma GOVQ + \delta RES + \varsigma DIST + \varepsilon$$

The estimation results are presented below:

Dependent Variable: GDPAG
Method: Panel Least Squares
Date: 09/04/14 Time: 12:24
Sample: (1989-2001) and (2002-2014)
Periods included: 2
Cross-sections included: 28
Total panel (balanced) observations**: 56**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.365763	0.177229	2.063790	0.0441
LGDPI	**-0.038634**	0.012617	**-3.062059**	0.0035
GOVQ	**0.030377**	0.007711	**3.939262**	0.0002
RES	**0.028888**	0.014297	**2.020533**	0.0486
DIST	**-0.012612**	0.011443	**-1.102112**	0.2756

R-squared	0.363333	Mean dependent var	0.011163
Adjusted R-squared	**0.313398**	S.D. dependent var	0.040626
S.E. of regression	**0.033663**	Akaike info criterion	-3.859771
Sum squared resid	0.057794	Schwarz criterion	-3.678936
Log likelihood	113.0736	Hannan-Quinn criter.	-3.789662
F-statistic	7.276170	Durbin-Watson stat	1.980597
Prob(F-statistic)	0.000103		

Substituting coefficients:

eq. 17 GDPAG = 0.3657 - 0.0386*LGDPI + 0.0303*GOVQ + 0.0288*RES - 0.0126*DIST

Where,

GDPAG – Annual average GDP growth rate per capita for the two periods stacked panel data

C – Constant (intercept)

LGDPI – Ln of the initial GDP per capita for the first year of the respective periods

GOVQ – Quality of governance (EBRD Governance and Enterprise Restructuring Indicator)

RES – Resource abundance dummy

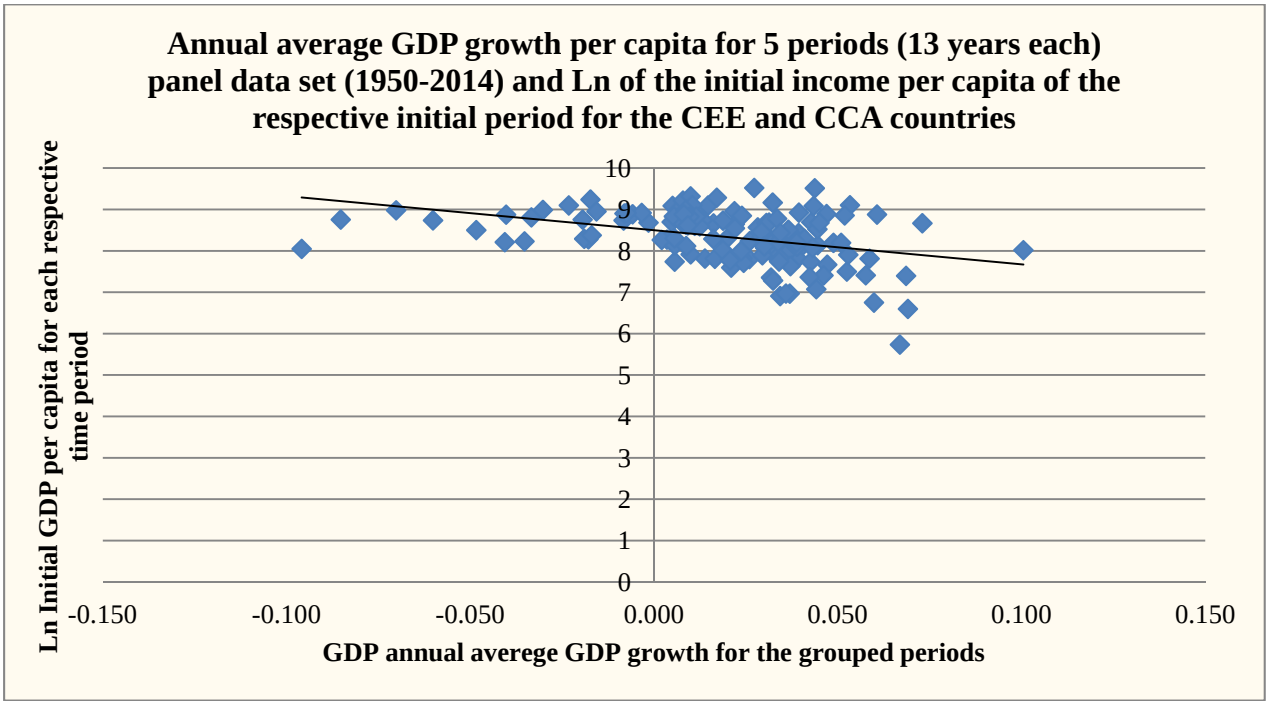
DISTANCE – Distance to Berlin or Stockholm, whichever is nearer

The coefficient β is negative and strongly significant, providing support for conditional convergence; the regression coefficient in front of GOVQ is positive and strongly significant, suggesting a strongly positive effect on the rate of economic growth from the quality of government; the coefficient on RES is positive and significant (i.e., resource abundance seems to be good for growth); and, the regression coefficient on DIST is with the expected sign and with similar magnitude of the previous estimate (see eq. 2a), though this time it is insignificant.

Re-calculating the speed of convergence it appears to be around 4 per cent with a half-life of around 18 years.

iii) We continue by utilising stacked by date panel [wording??] for five (13 years averages) periods (1950-2014)

Figure 33: Annual average GDP growth rate per capita for 5 periods (13 years each) panel data set (1950-2014) and Ln of the initial income per capita of the respective initial period for CEE and CCA countries



Note the location of points plotted to the left of the ordinate signifying the negative growth rate experienced by many of the countries under consideration during the period (1989-2001) of the initial severe shock of transition from central planning / communism to new economic and political structures.

We estimate eq. 18, below

$$\text{eq. 18} \quad GDPC = \alpha + \beta LGDPI + \varepsilon$$

and get the following results:

Dependent Variable: GDPC
Method: Panel Least Squares
Date: 09/09/14 Time: 12:40
Sample: 1950 1954
Periods included: 5
Cross-sections included: 28
Total panel (balanced) observations: **140**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	**0.176102**	0.031140	**5.655227**	0.0000
LGDPI	**-0.018701**	0.003728	**-5.016642**	0.0000

R-squared	0.154239	Mean dependent var	0.020322
Adjusted R-squared	**0.148110**	S.D. dependent var	0.029823
S.E. of regression	**0.027526**	Akaike info criterion	-4.333180
Sum squared resid	0.104561	Schwarz criterion	-4.291156
Log likelihood	305.3226	Hannan-Quinn criter.	-4.316103
F-statistic	25.16669	Durbin-Watson stat	2.246975
Prob(F-statistic)	0.000002		

Substituting coefficients:

eq. 19 GDPC = 0.1761 - 0.01870*LGDPI

Where:

GDPC – Annual average GDP growth rate per capita for the five periods stacked panel data

C – Constant (intercept)

LGDPI – Ln of the initial GDP per capita for the first year of the respective periods

Looking at the coefficient in front of LGDPI (negative, significantly different from zero, and strongly significant) we again observe strong support for the unconditional convergence hypothesis.

We continue by estimating a conditional convergence version of the same model, i.e., (eq. 20)

eq. 20 $GDPC = \alpha + \beta LGDPI + \gamma LDIST + \delta RES + \varepsilon$

The results are as follows:

Dependent Variable: GDPC
Method: Panel Least Squares
Date: 09/07/14 Time: 15:14
Sample: 1950 1954
Periods included: 5
Cross-sections included: 28
Total panel (balanced) observations**: 140**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.366087	0.053199	6.881533	0.0000
LGDPI	**-0.026925**	0.004026	**-6.688066**	0.0000
LDIST	**-0.017087**	0.003965	**-4.309199**	0.0000
RES	**0.015116**	0.006735	**2.244466**	0.0264

R-squared	**0.255849**	Mean dependent var	0.020322
Adjusted R-squared	**0.239434**	S.D. dependent var	0.029823
S.E. of regression	0.026009	Akaike info criterion	-4.432601
Sum squared resid	0.091999	Schwarz criterion	-4.348554
Log likelihood	314.2821	Hannan-Quinn criter.	-4.398447
F-statistic	15.58621	Durbin-Watson stat	2.386704
Prob(F-statistic)	0.000000		

Substituting coefficients we get:

GDPC = 0.3660 - 0.0269*LGDPI - 0.0170*LDIST + 0.0151*RES (eq. 6a)

Where:

GDPC – Annual average GDP growth rate per capita for the five periods stacked panel data

C – Constant (intercept)

LGDPI – Ln of the initial GDP per capita for the first year of the respective periods

LDIST – Distance to Berlin or Stockholm, whichever the nearer

RES – Resource abundance dummy

Once again our main results – strong conditional convergence effect (2.9 per cent speed of convergence with 25 years half-life to steady state; the nearer to Berlin / Stockholm, the higher the rate of economic growth and the more affluent the country on natural resources the higher the rate of economic growth -- are confirmed.

Resource abundance – is it good or is it bad for economic growth?

Before continuing our estimations we'll make a short digression to discuss the important issue of the interrelations between resource abundance and economic growth. So far our analysis has shown that, within our -- club of – countries, high resource abundance is associated with high annual average real GDP growth. While we cover in detail the intricacies and controversy surrounding the hypothetical "blessing" or a "curse" of the natural resource abundance in general (world background) in the next section, here we formulate a small empirical exploration by broadening our sample (of so far, just CEE and CCA countries) by adding the group of the OECD countries. As six of the member countries of both clubs overlap they are included just once as members of the club to which they have had longer-lasting membership so far (FCPE). Using the same time period (1950-2014) we estimate the following equation:

$$\text{eq. 21} \quad \text{GDPAG} = \alpha\,\text{INPT} + \beta\,\text{LGDP50} + \gamma\,\text{RES\_P} + \delta\,\text{RES\_H} + \varepsilon$$

obtaining the following results:

Dependent Variable: GDPAG
Method: Least Squares
Date: 09/12/14 Time: 17:32
Sample: 1 56
Included observations**: 56**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.078100	0.013625	5.731972	0.0000
LGDP50	**-0.006701**	0.001675	**-3.999827**	0.0002
RES_P	**-0.008158**	0.003628	**-2.248883**	0.0288
RES_H	**0.000392**	0.004556	**0.086124**	0.9317

R-squared	0.255899	Mean dependent var	0.023143
Adjusted R-squared	**0.212970**	S.D. dependent var	0.009792
S.E. of regression	**0.008687**	Akaike info criterion	-6.585309
Sum squared resid	0.003924	Schwarz criterion	-6.440641
Log likelihood	188.3887	Hannan-Quinn criter.	-6.529222
F-statistic	5.960986	Durbin-Watson stat	1.212568
Prob(F-statistic)	0.001427		

Substituting coefficients:

eq. 22 GDPAG = 0.0781 - 0.0067*LGDP50 - 0.0081*RES_P + 0.0004*RES_H

Where:

GDPAG – Annual average GDP growth rate per capita 1950-2014

INPT – intercept (constant)

LGDP50 – Ln GDP per capita 1950

RES_P – Resource abundance dummy for countries with underdeveloped / poor institutional structure[29]

RES_H – Resource abundance dummy only for countries with high quality institutional structure[30]

[29] RES_P is dummy variable for a set of countries with poor institutional structure and takes the value of "0" when we observe a country with share of its resource value added in GDP of less than 15%, whereas it takes the value of "1" when a given country has a share of resource value added in GDP higher than 15%.

[30] RES_H is dummy variable for a set of countries with good institutional structure and takes the value of "0" when we observe a country with share of its resource value added in GDP of less than 15%, whereas it takes the value of "1" when a given country has a share of resource value added in GDP higher than 15%.

We assume that the intuitional structure of the OECD countries is more advanced, characterised with high effectiveness and efficiency, while for the CEE and CCA countries it is considered to be in general of poor quality. On this basis the results again display conditional convergence, though the process is characterised by a lower speed (just about 0.9 per cent) per year and with half-life time to a steady state of around 103 years. It is worth noting that the coefficient in front of the RES_P is now negative (and significant), suggesting that resource abundance is having a negative effect on economic growth under the conditions of poor institutional structure; whereas, the regression coefficient in front of RES_H is positive, suggesting the opposite relation, though it turns out to be insignificant.

To investigate further we put into use the (World Bank) data on total natural resource rents as per cent of GDP (NRRENT12). We take averages of the time-series (available just for the period 2004-2012) and estimate the equation below:

$$\text{eq. 23} \quad GDPAG = \alpha C + \beta LGDP50 + \gamma NRENT12 + \varepsilon$$

Dependent Variable: GDPAG
Method: Least Squares
Date: 09/13/14 Time: 18:24
Sample: 1 56
Included observations: 56

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.073420	0.013936	5.268423	0.0000
LGDP50	-0.006166	0.001706	-3.614747	0.0007
NRRENT12	-0.000103	0.000101	-1.023503	0.3107

R-squared	0.198387	Mean dependent var	0.023143
Adjusted R-squared	0.168137	S.D. dependent var	0.009792
S.E. of regression	0.008931	Akaike info criterion	-6.546574
Sum squared resid	0.004227	Schwarz criterion	-6.438073
Log likelihood	186.3041	Hannan-Quinn criter.	-6.504509
F-statistic	6.558335	Durbin-Watson stat	0.971921
Prob(F-statistic)	0.002851		

Our estimate of β is again negative and strongly significant. The negative coefficient γ suggests that the higher the natural resource rate the lower the growth rate of GDP per capita in all of the countries under consideration (CEE, CCA, and OECD), however it's not significant.

As a next step, we add a dummy for the OECD member countries in equation 23 and find these results:

Dependent Variable: GDPAG
Method: Least Squares
Date: 09/13/14 Time: 18:34
Sample: 1 56
Included observations: 56

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.094595	0.011953	7.914195	0.0000
LGDP50	**-0.009605**	0.001522	**-6.309217**	0.0000
NRRENT12	**-1.03E-05**	8.33E-05	**-0.124086**	0.9017
OECD	**0.011922**	0.002220	**5.370733**	0.0000

R-squared	0.484396	Mean dependent var	0.023143
Adjusted R-squared	0.454650	S.D. dependent var	0.009792
S.E. of regression	0.007231	Akaike info criterion	-6.952147
Sum squared resid	0.002719	Schwarz criterion	-6.807479
Log likelihood	198.6601	Hannan-Quinn criter.	-6.896060
F-statistic	16.28419	Durbin-Watson stat	1.281564
Prob(F-statistic)	0.000000		

This time both the size and the significance of the coefficient β are strengthened, the regression coefficient γ (in front of NRRENT12) is again with negative sign and insignificant, while the coefficient on the OECD (dummy variable) is positive and strongly significant. The coefficient of mutual determination corrected for degrees of freedom almost triples in size.

This is suggestive of an interesting conclusion: some form of the resource "curse" is expected to be observed in any country that extracts natural resource rent. However, a substantial net negative

effect would obtain with certainty only in (underdeveloped) countries with poor institutional structures.

We are then in a position to suggest a reconciliation between the seminal works of both Mehlum et al (2006) and Sachs and Warner (1995). While their works cover different set of countries and different time periods, the nexus is unchanged.

iv) Finally we base our estimation on a pooled panel data for the period 1989-2014. Here we are using a real panel data and this allows us to control in general for individual heterogeneity of the countries involved. As we are interested in analysing the effect of the lagged value of the Ln of the GDP per capita on the dependent variable we use fixed effects model.

eq. 24 $\text{DLGDPC} = \alpha_i + \beta \text{LGDPC(-1)} + \varepsilon_i$

Dependent Variable: DLGDPC
Method: Panel Least Squares
Date: 09/09/14 Time: 11:31
Sample (adjusted): 1990 2013
Periods included: 24
Cross-sections included: 20
Total panel (balanced) observations: 480

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	**0.212050**	0.114309	**1.855058**	0.0642
LGDPC(-1)	**-0.023172**	0.013194	**-1.756310**	0.0797

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.046560	Mean dependent var	0.011397
Adjusted R-squared	**0.005016**	S.D. dependent var	0.082641
S.E. of regression	0.082434	Akaike info criterion	-2.110875
Sum squared resid	3.119066	Schwarz criterion	-1.928272
Log likelihood	527.6101	Hannan-Quinn criter.	-2.039098
F-statistic	1.120737	Durbin-Watson stat	0.841129
Prob(F-statistic)	0.323910		

Substituting coefficients:

eq. 25 DLGDPC = 0.2120 - 0.0231*LGDPC(-1) + [CX=F]

Where,

DGDPAG – Annual GDP growth rate per capita 1989-2013

C – Intercept (constant)

LGDPC(-1) – Lagged value of Ln GDP per capita

Here again our coefficient β is negative but at best weakly significant. This may suggest that if we take the time-invariant characteristics of the countries under investigation as indeed unalterable, convergence may never occur. But if we suppose that one cannot change human nature, but still could manage it realistically to some extent, we can add two important control variables, remove the fixed effects dummies and estimate the altered equation (eq.26) below

eq. 26 $DLGDPC = \alpha + \beta LGDPC(-1) + \gamma EDU + \delta GOVERNANCE + \varepsilon$

We estimate this equation using panel least squares, using White cross-section standard errors and covariance (d.f. corrected) and obtain the following results:

Dependent Variable: DLGDPC
Method: Panel Least Squares
Date: 09/15/14 Time: 19:09
Sample (adjusted): 1990 2013
Periods included: 24
Cross-sections included: 20
Total panel (balanced) observations: **480**
White cross-section standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.044107	0.050778	0.868623	0.3855
LGDPC(-1)	**-0.027938**	0.010166	**-2.748285**	0.0062
EDU	**0.010518**	0.004734	**2.221778**	0.0268
GOVERNANCE	**0.041624**	0.010800	**3.854059**	0.0001

R-squared	0.214409	Mean dependent var	0.011397
Adjusted R-squared	**0.209457**	S.D. dependent var	0.082641
S.E. of regression	**0.073479**	Akaike info criterion	-2.375348
Sum squared resid	2.569970	Schwarz criterion	-2.340567
Log likelihood	574.0836	Hannan-Quinn criter.	-2.361676
F-statistic	43.30429	Durbin-Watson stat	1.039572
Prob(F-statistic)	0.000000		

After substitution of the coefficients we attain:

eq. 27 DLGDPC = 0.0441 - 0.0279*LGDPC(-1) + 0.0105*EDU + 0.0416*GOVERNANCE

Where,

DGDPC – GDP growth rate per capita for the 1989-2013 period

C – Constant (intercept)

LGDPC(-1) – Ln of the level of GDP per capita lagged one period

EDU – Barro-Lee Average years of total schooling, age 25+, total

GOVERNANCE – EBRD transition indicator: Governance and enterprise restructuring

Now the coefficient β is of the same magnitude (as the previous equation) but strongly significant, and EDU and GOVERNANCE have significant positive effects on the GDP growth rate per capita.

Now we can compose together all our results into the table below:

Table 17: Convergence of GDP per capita in the CEE and CCA countries (former centrally planned economies) 1950-2014, various estimations of both conditional and unconditional models

	Cross-section regression		*Panel stacked by date*		*Panel stacked by date*		*Pooled panel*	
			1989-2014		1950-2014			
	1950-2014		2 by 13 years periods		5 by 13 years periods		1989-2014	
	Unconditional Model	Conditional Model	Unconditional Model	Conditional Model	Unconditional Model	Conditional Model	Unconditional Model	Conditional Model
β	**-0.010**	**-0.015**	**-0.010**	**-0.0386**	**-0.0187**	**-0.0269**	**-0.0231**	**-0.0279**
t-statistics	*[-3.6652]*	*[-6.4064]*	*[-0.9401]*	*[-3.0620]*	*[-5.0166]*	*[-6.6880]*	*[-1.7563]*	*[-2.7482]*
Distance to Berlin /Stockholm	--	**-0.0106**	--	**-0.0126**	--	**-0.0170**	--	--
t-statistics		*[-4.7208]*		*[-1.1021]*		*[-4.3091]*		
Reourse abundance	--	**0.0103**	--	**0.0288**	--	**0.0151**	--	--
t-statistics		*[2.6470]*		*[2.0205]*		*[2.2444]*		
Quality of governence	--	--	--	**0.0303**	--	--	--	**0.0416**
t-statistics				*[7.1298]*				*[3.8540]*
Educational Attainment	--	--	--	--	--	--	--	**0.0105**
t-statistics								*[2.2217]*
Adjsted R-squared	0.3153	0.6161	-0.0021	0.3133	0.01481	0.2394	0.005	0.2094
λ	**1.6%**	**5.1%**	**1.0%**	**4.0%**	**2.0%**	**2.9%**	**3.4%**	**4.6%**
t half-life	**68**	**46**	**69**	**18**	**37**	**25**	**30**	**24**
Jarque-Bera*	1.7916	1.4772	4.1456	0.4137	110.47	61.93	1961.2	1475
	(0.4082)	(0.4777)	(0.1258)	(0.8131)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Observations	28	28	56	56	140	140	500	500

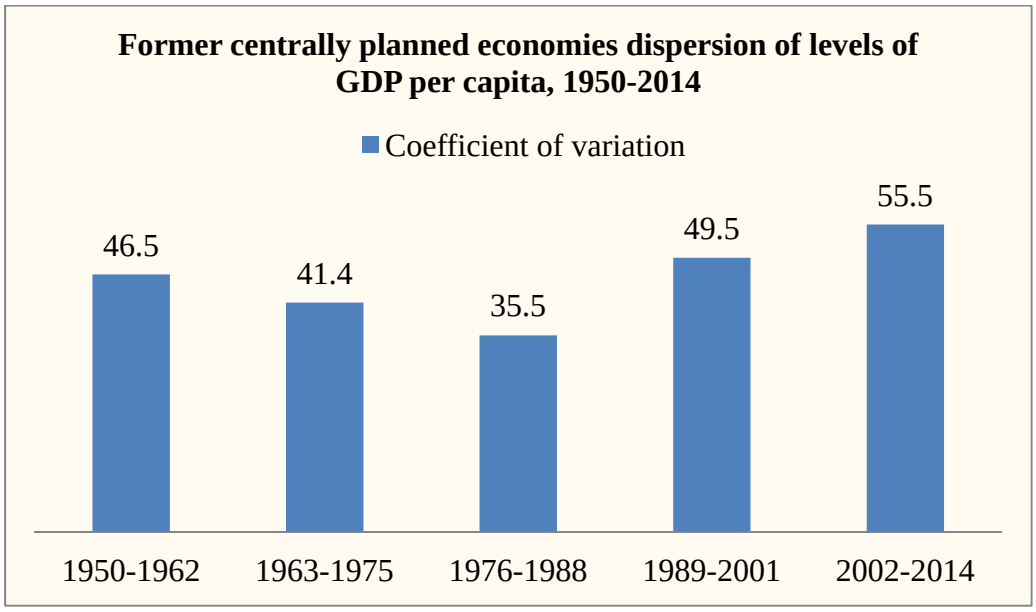
**Hence, for half of the estimates the OLS error can be taken to be normally distributed.*

While we obtain broad-spectrum supportive results for unconditional and conditional β convergence, this is just necessary, but not sufficient condition to detect σ convergence. Therefore, we directly calculate σ convergence for our sample of countries below.

v) σ -- Convergence:

In fact we calculate the standard deviation of GDP per capita across the former centrally-planned economies for the periods of 1950-1962, 1963-1975, 1976-1988, 1989-2001, and 2002-2014. The results expressed in per cent are depicted in the chart below.

Figure 34: Former centrally planned economies dispersion of levels of GDP per capita, 1950-2014

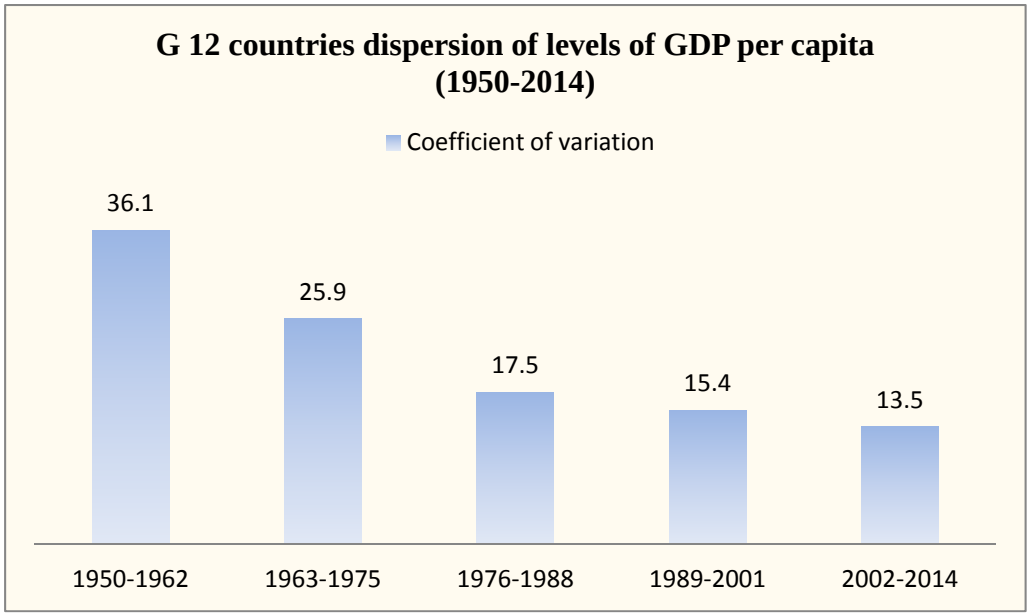


We observe that coefficient of variation started a declining trend from the period 1950-1962, displaying a reduction from 46.5 per cent to 41.4 per cent in 1963-1975, and then declining further to 35.5 per cent for the 1976-1988 episode. This trend may be associated with the reconstruction period after the World War II and continued extensive catch-up growth purposely supported by the former Soviet Union. This all changed in the next period (1989 -2001) with the beginning of the disintegration of the former Soviet Union, former Yugoslavia, and the entire structure of centrally-planned (socialist) economies. This shock and the transition process brought about significant

increase in the coefficient of variation up to 49.5 per cent (from the low point of 35.5); the increase in dispersion of the levels of GDP per capita continued during the next (most recent) period (2002-2014) though with a smaller magnitude (55.5 per cent).

For comparison purposes we present G 12 coefficients of variation over the same period:

Figure 35: G12 countries dispersion of levels of GDP per capita (1950-2014)



Concluding remarks

Our analysis provides evidence supporting the following propositions: i) poorer CEE and CCA countries are growing faster than relatively richer ones; hence there is absolute β convergence; ii) when control variables are included into our model larger (negative) β coefficients are displayed, supporting the phenomenon of conditional convergence.; iii) we estimate the speed of unconditional convergence to the (club's) steady state to lie in-between 1.6 to 3.4 per cent, whereas the speed of

conditional convergence stays in the range of 2.9 to 5.1 per cent; iv) there is no evidence of sigma (σ) convergence, in fact there is a significant increase in the dispersion of the levels of income across the economies under consideration; v) high resource abundance (within the setting of this club of countries) is associated with high economic growth; vi) high resource abundance within a broader background (including the CEE and CCA, plus OECD countries) is associated with an overall negative impact on economic growth (Sachs and Warner, 1995), however a net negative effect obtains only in countries with poor institutional settings (Mehlum et al, 2006); vii) location matters for growth – the nearer a country happened to be to Berlin or Stockholm (whichever nearer) the higher the rate of economic growth; viii) high quality of governance has a strongly positive effect on economic growth, and ix) the higher the educational attainment (proxy for quality of human capital), the higher the real GDP growth.

Still, it is not clear what exactly finding support for β convergence means. Does this support the hypothesis for decreasing returns to capital or is it simply to sustain the proposition that poor countries have strong propensities to catch up through the appropriation of technology?

Will these countries (with former centrally planned economic systems) be approaching half the distance to their (own club) non-growth steady state around 2064? Even if they do, wouldn't the rich nations of 2064 still be those that are rich at present?

While we cannot be completely certain about providing a positive answer to the first question; the answer to the second one -- after considering the self-reinforcing properties of the growth process -- may be somewhat more definite and in accord with the views of Baumol (1986) and Spolaore (2013):

> “The long run does matter. [...] [i]mportant current issues are, I believe, the product of path dependent processes whose mathematical expression must take the form of functionals rather than mere functions, meaning that we cannot understand current phenomena such as the relative productive capacities of different economies without systematic examination of earlier events which affect the present and will continue to exercise profound effects tomorrow.” (Baumol, 1986)

> “[l]ong-term persistence holds at the level of populations rather than locations. A focus on populations rather than locations helps us understand both persistence and the reversal of fortune, and sheds light on the spread of economic development.”(Spolaore and Wacziarg, 2013)

What factors may potentially help alleviate this predicament? The most promising (time-variant) factors would seem to be quality of governance and educational attainment (quality of human capital). The effect from enhancing any of these variables would lead to stronger growth and apparently faster convergence to the steady state. The problem of course is that this is much more easily said than possibly done.

Chapter II: Natural resource abundance -- is it a "blessing" or is it a "curse"

It is conspicuous that, more often than not, countries with oil or other natural resource wealth have experienced inferior economic growth in comparison to those devoid of such gifts of nature. This is pragmatically the case for at least the last fifty years or so. Does the poorer performance of the former countries signify that their comparative advantage in natural wealth is more apparent than real?

This phenomenon is commonly recognized as the "resource curse". There exists a vast literature on why countries might suffer "resource curse". We identify four different channels or transmission mechanisms (with various combinations and variations) which endeavour to account for the inverse statistical relationship between resource abundance and economic growth: i) Decline in terms of trade; ii) Volatility of revenues; iii) Quality of Governance; and, iv) Dutch disease.

Representative empirical works on the impact of natural resources on growth include Sachs and Warner (1995 and 2001) and Isham, Woolcock, Pritchett, and Busby (2005). These authors arrived at the conclusion that countries with a high ratio of resource exports to GDP have relatively lower rates of GDP growth. The result -- of negative and significant impact -- remains robust after introduction of controls for: quality of governance; initial level of per capita income; level of investment; inequality; and, trade policies. Hence, the results cannot be simply attributed to other omitted variables, or be explained by alternative ways of measuring resource abundance. In fact Isham et al. (2005) clearly demonstrate "[h]ow countries dependent on point source natural resources (those extracted from a narrow geographic or economic base, such as oil and minerals) and plantation crops are predisposed to heightened economic and social divisions and weakened

institutional capacity. This in turn impedes their ability to respond effectively to shocks, which previous studies have shown to be essential for sustaining rising levels of prosperity." A recent study based on detailed, disaggregated sectoral data for manufacturing finds: "[t]he cumulative impact of permanent oil windfall shocks to be significant, with a 10 percent increase in windfall associated with a 3.4 percent reduction in value added across industries and with a 3.6 percent reduction in industrial output (Ismail, 2010[31])." Another current paper providing evidence for 135 countries for the period 1975-2007, concludes: "[t]hat the response to a dollar of resource revenue is, approximately, to save 35 cents, decrease non-resource exports by 50 cents and increase imports by 15 cents (Harding and Venables, 2010)."

Other studies finding negative effects of oil wealth on economic performance include Sala-i-Martin and Subramanian (2003). However, the conclusions of Sala-i-Martin and Subramanian are qualified: "[s]ome natural resources appear to have a strong, robust and negative effect on growth by impairing institutional quality. Once institutions are controlled for, there is either very little effect of natural resources on growth or even a positive effect. In other words, owning natural resources on balance may still be a blessing rather than a curse [...] it is fuel and minerals -- that typically generate rents [...] that have a systematic and robust negative impact on growth [...] This effect is quantitatively significant, amounting to lower growth of about 0.36 percent per year." Furthermore their results "suggest that the impact of natural resources is nonlinear; that is, the marginal (negative) impact of natural resources on institutions depends positively on the level of

31 "The results are not sensitive to whether I use a pooled least-square estimation with country, industry and time dummies, or a fixed-effect panel estimation with a fixed effect for each sector in each country and time dummies (Ismail, 2010)."

natural resources itself. Evidently, oil corrupts and excess oil corrupts more than excessively." Kaldor, Karl and Said (2007) extend this nexus plausibly, whereby oil generally tends to weaken state institutions turning them eventually to failed states and ultimately causing violence and wars. "Even in the best cases, where oil rents appear to be successful in propping up some form of centralised authority, rents tend over time to exacerbate state weakness, risking the creation of state failure and threat of further 'new oil wars'. Oil wars are *rentier* wars[32]." Finally, in a recent work Konte (2012) models the unobserved heterogeneity of the relevant different growth regimes, testing if the natural resources turn to a curse or a blessing depending on the regime they belong to. The findings of this study "[i]ndicate that for the period 1970–2005 the data are best fitted by a model of two regimes. In one regime, an abundance of natural resources has a significant and positive impact on growth, while in the other regime; an abundance of natural resources does not enhance growth. The analysis of the determinants of whether a country belongs or not to the blessed-resources regime indicates that the level of democracy plays a crucial role, while education and economic institutions have no effect."

Simultaneously there are statistical studies, e.g., Herb (2005) which "[d]id not find consistent support for the thesis that rentierism has a harmful net effect on democracy scores." "Rent wealth does not make countries better governed, but neither is it a curse." Furthermore, Alexeev and Conrad (2009) criticise the conclusions that abundance of resources negatively affect economic growth, and that this negative effect works through the structure and quality of political institutions; stating: "[w]e believe there is little or no evidence that the large endowments of oil or minerals slow

32 "Whatever the motivations of fighters, and whatever religious, ethic or other differences also drive conflict, where oil is present these wars tend to involve struggle for control over the exceptional gains generated by this valuable resource (Kaldor, Karl and Said, 2007."

long-term economic growth. In fact, the data available so far suggest that natural resources enhance long-term growth. We have demonstrated this result by focusing on the levels of per capita GDP rather than on the rates of growth over any given period of time (Alexeev and Conrad, 2009).” In addition, they provide interesting anecdotal evidence (dis)connecting the resource wealth with the prevalent political institutional structure. They compare Belarus, Russia, and Ukraine -- countries with very similar inheritance as being both, Slavic countries and (for a long period) part of the former Soviet Union. Given that Russia is the richest country in terms of natural resources and Belarus the poorest (with Ukraine somewhere in between), based on the natural resource curse hypothesis one would expect Belarus to have the best institutional structure and the highest GDP per capita and Russia the worst institutional structure and lowest GDP growth per capita. Nothing could be further from the truth.

In the same vein Papyrakis and Gerlagh (2004) affirm: "In the twentieth century, resource abundant countries such as Norway and Iceland experienced remarkable and sustained growth rates. Hence, natural resource wealth may stimulate growth but only under certain conditions. A natural resource economy that suffers from corruption, low investment, protectionist measures, deteriorating terms of trade and low educational standards will probably not benefit from its natural wealth due to adverse indirect effects. Our empirical analysis indicates that natural resource wealth increases growth, if negative indirect effects are excluded." However, it should be pointed out that this development (sustained economic growth) did not take place in a vacuum; thus the most probable explanation of the success stories of Norway and Iceland is the pre-existence of trustworthy institutional and political structures in both countries. Similarly, Polterovich et al. (2010) conclude: “Nevertheless, it does not appear that resource rich countries grow less rapidly due to their resource

wealth. This is explained by the fact that they pursue good policies in some areas and enjoy the advantages of having resource rent. In particular, resource abundant economies have lower budget deficits and inflation, higher investment/GDP ratios, higher inflows of FDI as compared to GDP, and more equitable distribution of income."

One possible rationalization of why different studies may have come to different results is the time-span of the dataset used, and the proxy for natural resource concentration applied (resource reserves v. resource exports). "Treating resource dependence as endogenous, we find it to be insignificant in growth regressions, with no effect on institutional quality. While we find resource abundance to be significantly associated with both growth and institutional quality, the association runs contrary to the resource curse hypothesis: greater abundance leads to better institutions and more rapid growth. [...]These concepts are possibly correlated -- countries with large resource stocks may derive high incomes from extraction and because of Dutch-disease arguments or otherwise, may specialise in primary exports and become dependent on resources. But some resource-abundant countries are not dependent on resources, and some relatively resource-scarce countries are. We find countries should not turn their back on resources wealth to lower resource dependence (Brunnschweiler, C. and E.H. Bulte, 2007)." The argument being that commodity exports are vastly endogenous. Concurrently fundamental trade theory readily expects that a country may prove to have a high mineral share in exports which does not translates automatically into a higher endowment of resources than other countries, i.e., absolute advantage but because it does not have capacity to export manufacturing goods, i.e., comparative advantage. This provides a clear account for the inverse statistical correlations between mineral exports and economic development.

A simple conclusion, so far, is that there is no straightforward single explanation of what creates a "blessing" rather than a "curse". Nor is there any agreement on a particular set of explanations. Hence, this state of affairs provides support for following an individual line of investigation rather than aiming to bring about some sort of a universal wrapping up of this theme at the cost of oversimplifications. Furthermore, the instances of successful resource-based industrialisation throughout modern economic history, e.g., United States, Chile, Malaysia and the clear record of no adverse effect on the Norwegian economy from its major oil discoveries and extraction are consistent with the view that natural resource abundance should not be taken, without further scrutiny, to be a curse.

The empirical and theoretical works, above, aim in general to establish a statistical relationship between large resource revenues and poor economic performance. Another, related, appealing question is: what the transmission mechanism is between the two variables. In what follows we review the literature on the possible channels through which natural resource abundance may impact economic growth. In doing so, we are conscious that many of the ideas and the concepts involved have come to imply so much that if not carefully examined and disentangled they would lose their content.

Terms of trade divergence

This thesis accepts the claim that in a long-run, there is some tendency for the prices of primary products to decline in relation to manufactured products. It has become known as the Prebisch-Singer thesis (PST) after the names of the two economists who independently developed it --

Prebisch (1950) and Singer (1950). Singer (1998) describes the PST as follows: "The PST, taken by itself, (and leaving aside the case of rich oil exporters), would create a presumption (although no certainty) of divergence within the world economy. Other things being equal, falling terms of trade for poorer countries and improving terms of trade for richer countries would mean greater international inequality between countries." In short, this is to say that productivity in manufacturing is generally higher in comparison to agriculture, oil and mineral extracting industries. Hence, in net barter terms of trade (as well as in income terms of trade) expressions, manufacturing is exchanging a smaller share of their output for the produce of the latter sectors of production. In considering this outcome one needs to bear in mind the assumption that the sectors of agriculture, oil and mineral extraction must be rather competitive, whereas manufacturing ought to be rather characterised by monopolistic competition. Furthermore, the declining trend of primary commodity prices to manufactured goods is supported by the low income elasticity of demand for primary goods plus the more efficient (reduced) utilisation of primary goods due to the technical progress.

The practical basis of the argument has been challenged by several writers, including; Viner (1952) Haberler, (1959), Cuddington, (1992), Cuddington, Ludema, and Jayasuriya (2002), and Persson and Terasvirta (2003).

There are numerous supporting empirical studies corroborating the existence of a long-term secular decline in primary product prices, e.g., Grill and Yang (1988), Brohman, (1996), Leon and Soto (1997), Harvey, et al. (2008) and Erten and Ocampo (2012). For example Grill and Yang (1988) present evidence “[t]hat the prices of all primary commodities (including fuels) relative to those of traded manufactures declined by about 36 percent over the 1900-86 period, at an average annual rate of 0.5 percent.” More recently, on the bases of a dataset containing data since 1650 Harvey et

al. (2008) show that eleven major commodities exhibit a long-term decline in their relative prices. In their opinion “[t]his provides much more robust support that the Prebisch-Singer hypothesis is a relevant phenomenon for commodity prices” This finding is supported by Erten and Ocampo (2012). They apply super-cycles methodology – identifying the cycles by band-pass filter – and report: “Another important finding of the paper is that, for non-oil commodities, the mean of each super cycle has a tendency to be lower than that of the previous cycle, suggesting a step-wise deterioration over the entire period in support of the Prebisch-Singer hypothesis.” Finally a recent influential study Baffes and Etienne (2014) maintain that they have been able to reconcile the PST with Engel’s law and Kindleberger’s thesis, thus, in fact, strongly supporting the Prebisch-Singer thesis. The authors observe: “The paper employed a reduced-form price determination model and applied it to 1960-2013 annual data for five commodities...It concluded that income has a negative and highly significant effect on real agricultural commodity prices. This finding is consistent with the Engel’s Law and Kindleberger’s thesis, the predecessor of the Prebisch-Singer hypothesis. Moreover, it is shown that income’s negative impact on real prices operates through the manufacturing price channel (the deflator)...Other key drivers include (in order of importance) the role of energy costs, physical stocks, and monetary conditions.”

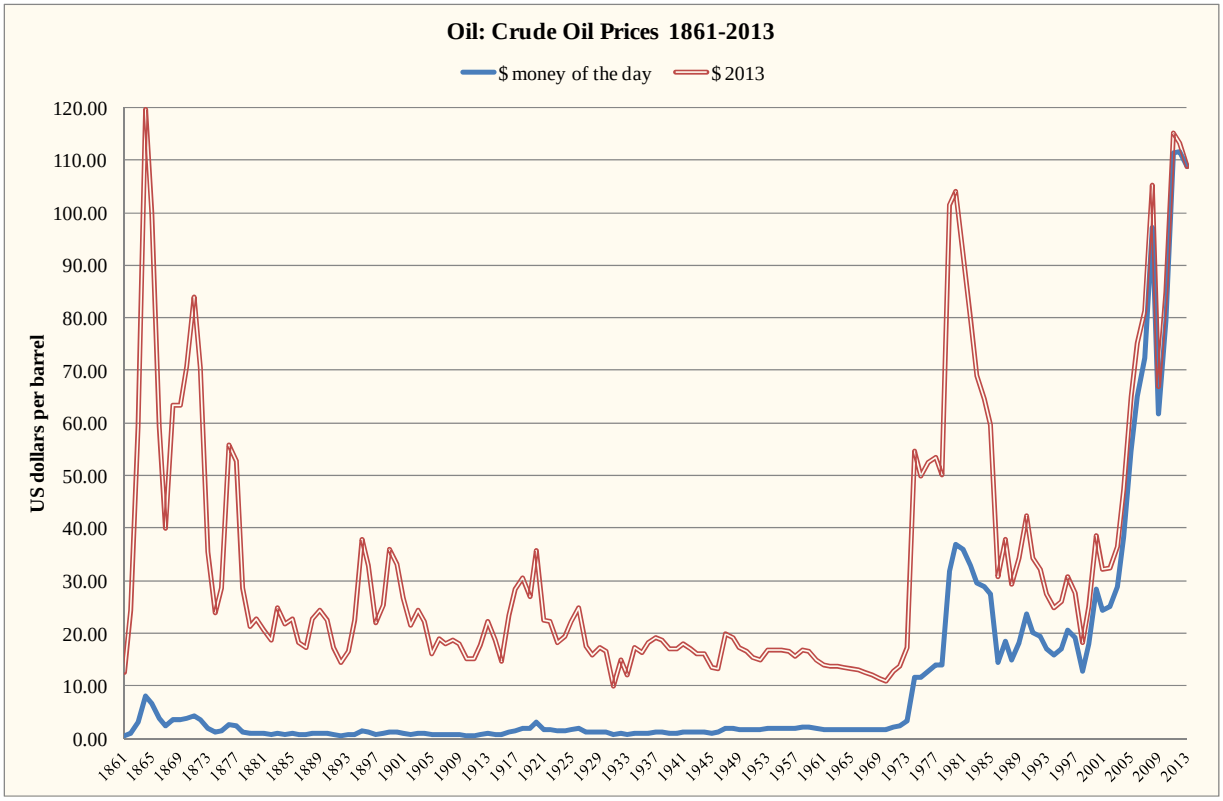
There is, as well, a very substantial group of researchers which find the evidence limited and remain uncertain (or marginally in favour or against the PST), e.g., Pindyck, (1999) observes: “I have argued that the theory of depletable resource production and pricing, and the actual behaviour of real prices over the past century, both imply that non-structural forecasting models should incorporate mean reversion to a stochastically fluctuating trend line. [...] These models seem promising as a forecasting tool, even though the results in this paper were mixed.” Also, Kellar and

Wohar (2002) find “modest support” for the PST. In the same vein Meng, Lee, and Payne (2012) conclude: “The main findings of this study reveal that 21 out of the 24 commodity prices are found to be stationary around a broken trend, implying that shocks to these commodities tend to be transitory. Only three relative commodity price series are found to be difference stationary. There are only 7 series in which the relative commodity prices display negative trend more than 50% of the time period examined;...Compared with past studies, our findings provide even weaker evidence to support PST."

Given that comparative commodity prices over manufacturing prices change constantly in the world markets, for a sluggish decline in primary commodity prices to be able to explain the sort of deterioration in economic performance connected to the resource curse, the respective economies must not be in a position to apply counteractive measures due to their lack of sophisticated technological and macroeconomic policy capacities. In general, this state of affairs would tend to bring about not a world of economic convergence but rather one of increased divergence. While it is acknowledged that, on occasions, primary goods prices have been falling considerably and over a rather short interval of time, still, for oil the view of a declining trend in real prices over time does not seem to have empirical support. Thus taking a five-year moving average of oil prices from 1955 in 2013 US Dollars the price in 1973 was $13.23 per barrel rising steadily to a peak of $89.27 in 1983, followed by a relentless decline to $25.54 by 1999. Since 2000 the prices rose steadily but gradually up to 2003 reaching $32.95 and then ascended sharply again, until attaining $97.13 in 2012 and remained virtually unchanged during 2013. Certainly, given these rapidly fluctuating oil

revenues during the last forty years or so[33], where swift ascent in prices is followed by a period of fast deterioration, and then again by rising prices would go some way to explain the resulting apparent poor or high-quality economic performance (of a given oil exporting country) depending on the end point of the respective analysis.

Figure 36: Crude oil prices 1861 to 2013

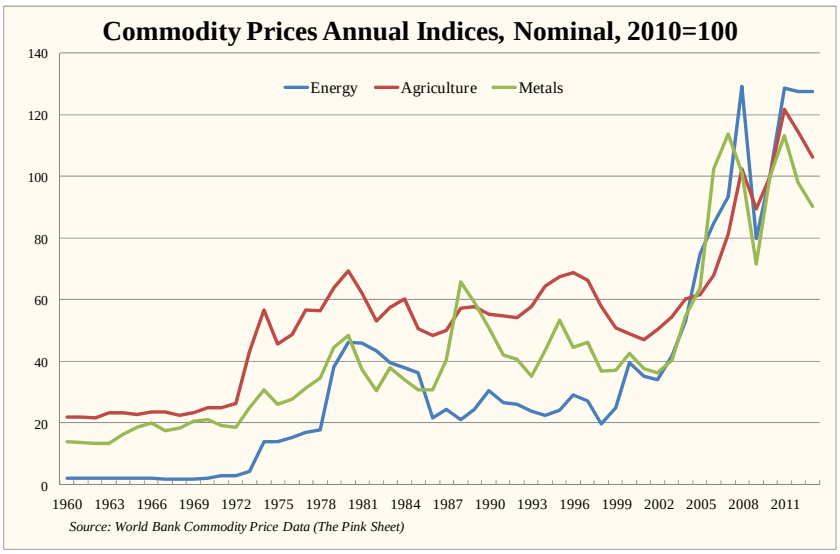


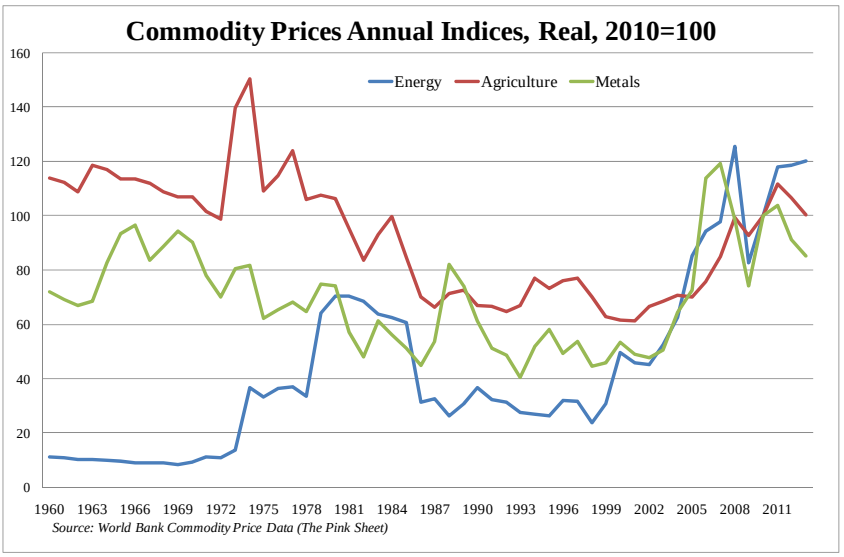
Source: BP Statistical Review of World Energy, June 2014

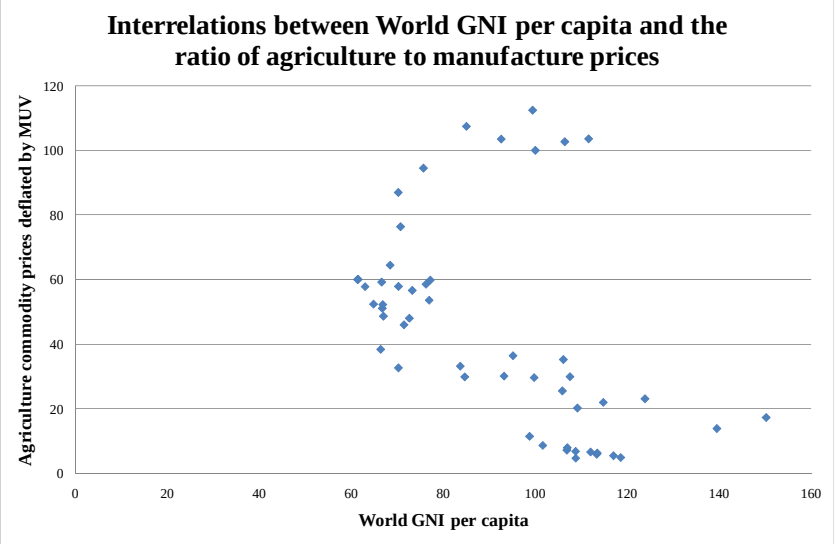
The next figure (Figure 37, below) shows the effect not only of time but also of income on the terms of trade of primary commodity prices over manufactures prices.

[33] The end point of this study is 2013 as shown at Figure 36, below.

Figure 37: a), b), and c): Commodity Prices and Income







Note: MUV (Manufactures Unit Value Index) is a proxy for the price of developing country imports of manufactures in U.S. dollar terms, used to assess cost escalation for imported goods. Updated twice a year, the index is a weighted average of export prices of manufactured goods for the G-5 economies, with local-currency based prices converted into current U.S. dollars using market exchange rates (data.Worldbank.org).

Revenue volatility

Natural resource abundance is, as a rule, accompanied by booms and busts in the prices of primary commodities and quantities supplied. In particular the market for oil and gas is ruled not only by real-economic business cycles, but perhaps even more notably by investment cycles and financial markets speculation. The resulting fluctuations in export earnings cause real exchange rate volatility and subsequent uncertainty that tends to impair exports and foreign investment.

The main sources of revenue volatility could be summarised as: i) variation in rates of extraction; ii) variability in the timing of payments by oil companies to the respective governments; and, iii) fluctuations in the price of the natural resource.

Mikesell, (1997), Auty, (1998), Hausmann and Rigobon (2003), Blattman, Hwang and Williamson, (2007), and van der Ploeg, (2008) put forward revenue volatility as one of the most important explanations of the resource curse. The basic argument is that "[t]he resource curse is foremost a problem of volatility. The high volatility of world prices of natural resources causes severe volatility of output per capita growth in countries that depend heavily on them. The resulting volatility of unanticipated output growth has a robust negative effect on long-run growth itself and is a curse. This is not limited to oil-exporters, but also applies to exporters of copper, coffee, foods, etc. which include many of the world's worst performing countries. Also, ethnic tensions, which are often fuelled by resource wealth, and current account restrictions increase volatility. The latter effect is especially strong in resource-rich countries. Government spending bonanzas after windfall resource revenues also increase volatility to the detriment of growth, because revenue drops inevitably follow (van der Ploeg, 2008)." Another account of the effect of the volatility on the economy is provided by Hausmann and Rigobon (2003). The transmission mechanism works its way through the interrelations between non-tradables, in which the oil abundant economy is specialising, non-resource tradables and the resource tradebles (oil). Given that the oil economy specialisation in the non-tradables sector grows with time, the real exchange rate movements will show greater volatility as a response to demand shocks (triggered by revenue volatility), as these have to be accommodated by expenditure-switching rather than reallocation of labour and capital. Such adjustments would require much more significant changes in relative prices including interest rates. Noting that in this setting the volatility of profits in the non-resource tradable sector is higher than the volatility in the non-tradables sector, brings one to the conclusion that: "As volatility increases, sector-specific interest rates rise causing a decline in the output that is larger for the non-resource tradable sector. A multiplier process is set in motion where an initial rise in interest rates

causes the tradable sector to contract, further raising volatility and interest rates until the sector disappears (Hausmann and Rigobon 2003)."

The empirical support for the existence of such volatility is beyond doubt (e.g.,Mikesell, 1997 and Blattman, Hwang and Williamson (2007)). It creates serious problems by making it almost impossible for governments to pursue sound fiscal policy. Equally important, thus generated uncertainty produces strong obstructive effect for the long-term investments. Gylfason et al., (1999) and Gylfason and Zoega (2006) provide evidence that domestic investments are inversely related to the dependence on primary product exports. Following this line of reflection, it would be then natural to compare the savings rates across resource abundant countries and see if they have a particular association with their respective economic development. However, for making a meaningful comparison the savings rates indicator should be taking into consideration the depletion of the non-renewable resources. "We therefore need savings rates that take changes in countries' resource wealth into account[34]. In constructing that, we take as a starting point the traditional savings rates from national accounts, and then subtract net extraction of oil, gas, minerals, and timber. We term these savings rates 'resource-adjusted savings rates' (Torvik 2009)."

Table 20, below, depicts selected countries that have escaped the "resource curse" and those that have fallen prey to it, together with their respective resource-adjusted saving rates. On inspection,

[34] A similar concept is developed and used by the World Bank: "Adjusted net saving (ANS) measures the true rate of saving in an economy after taking into account investments in human capital, depletion of natural resources and damages caused by pollution. Adjusted net saving, known informally as genuine saving, is an indicator that aims to assess an economy's sustainability based on the concepts of extended national accounts.
Positive savings allow wealth to grow over time thus ensuring that future generations enjoy at least as many opportunities as current generations. In this sense, adjusted net saving seeks to offer policymakers who have committed their countries to a "sustainable" development pathway, an indicator to track their progress in this endeavour (Beyond GDP, Measuring progress, true wealth, and the well-being of nations, Environment Department, World Bank, 2012)."

this table reveals a tendency of the countries who have escaped the resource curse to have higher resource-adjusted savings rates than those which have not. The countries listed as success stories, have predominantly positive resource-adjusted savings rates. In contrast, the countries that have not escaped the curse, have mostly negative resource-adjusted savings over the period. This indicates that “blessed” and “cursed” among resource-abundant countries differ in savings. "Note, however, that the table says nothing about causality—we cannot know if overspending of resource income has resulted in bad economic development, or if bad economic development has resulted in overspending of resource income. Thus all we are left with from this is a correlation, albeit an interesting one (Torvik 2009)."

Table 18: Resource-adjusted savings rates as percentage of GNI, average 1972–2000

Countries claimed to have escaped the resource curse		Countries claimed not to have escaped the resource curse	
Australia	18	Algeria	6.11
Botswana	33	Congo	-11.9
Canada	15.7	Mexico	10.8
Chile	7.4	Nigeria	-22
Ireland	22	Saudi Arabia	-21.5
Malaysia	19.9	Sierra Leone	1.8
New Zealand	18.4	Trinidad and Tobago	-3.9
Norway	17	Venezuela	-1.8
Oman	-26.6	Zambia	-5.8
Thailand	20	Ecuador	NA
USA	15.1		

Source: Matsen and Torvik (2005).

Quality of Governance

Are resource-abundant countries perhaps “cursed” because their respective institutions are inferior? Is it just apparent or is it perhaps real that weak institutions are endogenous to mineral wealth? One thing is for sure -- any significant revenue accumulation in the state budget inevitably attracts greater government involvement, which is inevitably an important factor in determining the long-term trend in economic performance.

Many papers on the “resource curse” find the most important part of the explanation of the phenomenon as effectively political, determined by the quality of government, e.g., Mikesell, (1997) Sarraf and Jiwanji (2001), Isham et.al. (2005), Ulfelder (2007), Ross (2001, 2006, 2014), and Wright et al. (2014). Isham et al. (2005), concludes that weak institutions are standard (endogenous) in resource abundant countries, terms of trade shocks are unavoidable and consequently they are predestined to endure low economic growth. In his words: "[c]ountries dependent on point source natural resources (those extracted from a narrow geographic or economic base, such as oil and minerals) and plantation crops are predisposed to heightened economic and social divisions and weakened institutional capacity." Studies rejecting the resource abundance - weak quality of governance connection, e.g., Lederman and Maloney (2003), Wright and Czelusta (2004), Mehlun and Torvik (2006), Haber and Menado (2011) tend to maintain that the negative outcomes from huge export of primary commodities are not an automatic result from a "natural" economic mechanism, but are due to a bad quality of governance. In their view institutions are exogenous, rather than endogenous to resource-abundance. "We have shown that the quality of institutions determines whether countries avoid the resource curse or not. The combination of

grabber friendly institutions and resource abundance leads to low growth. Producer friendly institutions, however, help countries to take full advantage of their natural resources (Mehlum and Torvik 2006)." This strand of the literature acknowledges that the foundations of the few success stories are competent, strong government structures and sound macroeconomic policies. The best example is Botswana (Sarraf and Jiwanji, 2001, Iimi, 2006, and Lewin, 2010).

Furthermore some studies claim that "At very least we should probably abandon the stylized fact that natural resource abundance is somehow bad for growth and even perhaps consider a research agenda on the channels through which they may have a positive effect, possibly, through inducing higher productivity growth (Lederman and Maloney 2003)." Finally, Acemoglu et al., (2001) transcend (in time) the exogenous and endogenous analysis of the quality of institutions finding that while important difference in economic development can be attributed to the effectiveness of given institutions, these are, *per se* a legacy of colonialism and have little to do with any resource abundance effect. Overall, there seems to be emerging a broad agreement between both proponents and critics of the quality of government explanation of the “resource curse” that institutions in resource-abundant states are generally clumsy, slow-moving and inefficient. Consequently, all-inclusive, sustainable economic development will only be possible in such states where good institutions have already been incumbent before the natural resource discovery or where social structures and domestic forces are conductive to the emergence of such government.

Based on the various causal mechanisms linking the natural resource abundance “curse” with the quality of governance we present the following classification: i) Inappropriate and unsustainable

decision making; ii) Unsustainable investment choices; iii) Imaginary industrialistion; iv) Society and its collective standards; and v) Bad rent seeking driving good entrepreneurs out.

Inappropriate and unsustainable decision making

Why are such flawed decision making procedures bound to take place? The most important reasons include: i) The huge resource revenue received by the government is intensifying "great" expectations among the general public. Hence, to keep the public more or less content government disbursements need go up promptly. However, given the characteristically low absorption capacity of the resource dependent economy and in the lack of a feasible long-term strategy (by definition this is a windfall) the spending is unlikely to be efficient, nothing to say about sustainable (Auty, 2001); ii) another related factor is that this (spending) response is likely to overrule / ignore normal due diligence procedures and disregard prudence (given the immense windfall of money almost any mistake "is possible to fix") (Sarraf and Jiwanji, 2001); and, iii) as the decision-making process is concentrated in a very few hands; these few high-ranking officials who constantly and mainly engage in the redistribution of huge funds are in a real danger of believing that the windfalls are earned by them and they can allocate them as they see fit without any public dialogue. Of course this fixation absorbs all government energy away from establishing competitive industries and the creation of broad-based wealth. However, these diverse rent beneficiaries develop in time an insatiable demand, which surpasses (and simultaneously undermines) the capacity of the resource sector.

Unsuitable investment choices

Following on the previous part it should not come as a surprise that resource-abundant countries generally fail to successfully develop the productive base of their economy. It is not easy to find a productive outlet for public investments and most of the investments go to the non-tradable sector of the economy and for cosmetic infrastructure projects, whereby employment opportunities (for reason of social harmony) are provided in an inefficient way. Furthermore, even if more reasonable investments were to be attempted in the non-oil tradable sector, they unavoidably meet the constraint of the limited absorptive capacity of the reassures dependent economic system. As well, there is a strong bias towards new capital investment; building it once and for all without any planning for the necessary maintenance of the finished projects. This comes as a result of the nature of these investments even if they are put into supposedly manufacturing enterprises; these undertakings are by design not expected to be competitive and autonomous, there are just an artificial structure providing opportunity for recycling and redistributing oil-revenues (Cherif and Hasanov, 2012; Richmond et al., 2013).

Imaginary industrialization

This area concerns the industrial policies adopted following the resource revenue windfall.

Resource dependent countries have not been successful in promoting a competitive manufacturing sector (Mikesell, 1997). Many such countries have tried to implement industrial policy based upon import substitution. Primarily this course of action came into existence as a mechanism to supposedly help break out of the circle of underdevelopment (Auty and Kiiski, 2001). Interestingly the policy of a closed trade regime (protectionism) initiated by many resource dependent countries' governments are seen as a counter-action against one of the familiar Dutch disease symptoms --

declining employment; thus perpetuating the vicious cycle of further increased resource dependence, additional economic imbalances, falling productivity, and finally a contraction in non-oil (tradable) sector output. Such policies typically introduce subsidies and establish strong protectionism (trade barriers). The problem with this approach is that is costly and generally ineffective, turning out to be an incubator for vested interest groups, proving detrimental to other sectors and consumers alike. Though, in some instances temporary subsidies can have positive effects; subsidies were important for Malaysia in reinforcing its production base and consequently, thriving economic development (Usui, 1998, and Rasiah and Shari, 2001), as well as, for prevention of the Dutch disease contagion for Norway (Larsen, 2003). Furthermore, given that manufacturing through its specific learning-by-doing and spillover effects is identified as the most important dynamic source of technological progress, any source (e.g., an easy resource income) that hinders competition, creativity and diversification will considerably deter economic development (Verdoorn 1949, Kaldor, 1967, Krugman, 1987 and Matsuyama, 1992). Finally, a recent prominent study finds that the more advanced are the specific manufacturing knowledge and capabilities of a given country, the more complex and advanced goods it produces, resulting in higher economic growth and income (Hausmann and Hidalgo, 2012). Torvik, (2001) disagrees on this important issue claiming that “learning by doing” is not peculiar to the manufacturing sector only.

Society and its collective standards

It is important to note that all macroeconomic policy decisions, including investment policy, social protection, industrialisation strategies, and fiscal redistribution do not come about in a vacuum -- these are all a result of a complex interaction among various social groups, endorsing diverse strategies, and making important political choices. However, the reality is too often very different

from the perceived expectations. Then, different social groups and different individuals would react or take on a new initiative in their own way. Depending on their driving motives, whether based on potential incentives or on a perception for a mission or on a mixture of both factors, the "best" may use their talent and energy and *de facto* propel the country to a new, higher level of development, promoting fairness and reward for high efforts and increased productivity. However, it is quite possible that the most influential people in the country have little in common with the most enlightened ones; in some cases they may be mediocre or even outright criminals. Such a cohort of people will inevitably tend to separate their personal benefits from the responsibilities related to their high positions in the structures of government, and concentrate on the former. Being incompetent and incapable of creating any new value or even lacking any notion of such a prospect, they will automatically concentrate on rent-seeking activities. This behaviour would predictably damage the economy, by reducing economic growth, by brain drain (the best leave the country), and by endangering the social fabric, i.e., for the privileged there is no need (in the so created primitive economic structure) for highly intelligent and capable managers, but for loyal ones, hence such individuals are then established as the most influential "leaders".

In theory, one may imagine that the vast rents thus acquired may be used for productive investments (rather than finding its way to foreign accounts), hence eventually turning the bad thing (curse) into a potentially good one (blessing). Such an event is very unlikely to materialise as by its nature it would be the foundation of the demise of the illusory elite. "There is no predictability in the behaviour of some princes, no recourse for stolen proposals, no framework for development, and no assurance that investors will maintain control over their investments. These conditions are not attributable to rent per se, but rather to uncertainty in the investment environment which largely

reflects the personal nature of the state. Any preference for trade reflects the political reality of insecurity (Okruhlik, 1999)."

Finally, we should note that “Democracy does not insure good government, nor are all oligarchies poorly governed” (Mikesell, 1997). The democratic credentials of Malaysia, Indonesia, Oman, and (Pinochet’s) Chile are dubious and yet these countries avoided the “curse”.

Bad rent seeking driving good entrepreneurs out

There is a very close relation between poor governance, resource dependency and rent-seeking. However, these are different phenomena. While the degree of resource dependence of a given country is generally measured by the share of this resource in relation to the relevant GDP or the applicable total export, the magnitude of rent-seeking is measured by the fraction of rent in the government revenue obtained. The concept of rent is characterised by its autonomy from the efforts put in generating it; by its source; and, its role in the process of production. In short, the rent emerges as a side-effect of (resource) export, a negligible part of the available labour resources are involved in acquiring it, and it is largely a subject of redistribution, Okruhlik, (1999), Herb, (2005), Congleton, Hillman, and Konrad, (2008), Svensson (2000) and Auty (2007).

"The emerging theory of rent cycling focuses on the often neglected interaction between politics and the economy in developing countries. It grows out of observations about the three principal forms of rent: natural resource rents, geopolitical (foreign aid) rents, and rents contrived by government intervention to change relative prices (Auty, 2007).” Such a disruptive process is likely to commence when both politicians and entrepreneurs in a given resource-abundant country

recognize that the profitability of any potentially viable project is diminutive in comparison to the rent (potentially) available from natural resources. The result is an explosion of rent-seeking; the substantial proceeds to those who are capable to capture it are coming at the expense of the potentially good entrepreneurs and destabilisation of the normal functions of the entire economic system.

Table 19: Total Natural Resources Rent, per cent of GDP

	2004	2005	2006	2007	2008	2009	2010	2011	2012
Azerbaijan	48,4	65,1	68,2	62,9	63,8	42,8	46,1	44,0	39,8
Kazakhstan	45,4	50,2	46,5	40,8	48,5	33,1	35,2	37,0	32,1
Kyrgyz Republic	5,1	4,7	5,0	4,4	7,2	8,3	12,0	12,9	15,0
Russian Federation	32,3	38,8	33,9	28,3	31,8	20,1	21,1	21,9	18,7
Norway	16,6	20,5	19,7	17,8	21,9	13,2	13,3	13,6	12,0
Mongolia	17,3	19,6	33,7	31,9	31,7	26,0	41,6	44,9	28,7
Romania	4,6	4,9	4,2	3,1	3,7	2,3	2,5	2,8	2,8
Serbia	2,1	2,2	2,1	1,9	2,6	1,7	3,4	4,4	4,3
Bulgaria	1,6	1,9	3,1	2,6	2,5	1,7	2,6	3,1	2,8
Kuwait	51,7	61,8	60,3	57,1	63,7	44,5	51,7	58,8	55,1

Source: World Development Indicators, World Bank

In such (resource-abundant) institutional settings, the benefit from unproductive activities prevails over the benefit from entrepreneurial and productive activities. According to Larsen (2004), rent-seeking is based on pecuniary interest cliques that "prey[s] on victimized weaker groups in a non-transparent way, affecting the countries' production, labour effort, trust and investment process. Such groups may for example be a ruling class or elite of powerful allies. But it could also be larger segments of society that come together in large coalitions, such as unions, and threaten major strikes, thereby initiating a rush to relatively higher compensation and conflicts of relative position." In the same vein Gylfason (2006) emphasizes that excessive rent-seeking leads to concentrating economic and political strength in the hands of privileged groups fostering

corruption, thus reducing both economic efficiency and social equity. E.g., in resource-rich countries such as Mexico and Nigeria, where competitive rent-seeking is widespread, political and economic institutions are weak and lack of transparency and accountability is the norm. Such behaviour distracts attention from goals of long-term development towards maximizing rent. Such rent-seeking "will lower steady state income and therefore growth along the steady state (Sachs and Warner, 1997)."

Dutch Disease or Dutch Health, Empirical Investigation

The term "Dutch disease" has been initially used in 1977 by The Economist[35] to articulate the decline of manufacturing in the Netherlands following the discovery of gas during the 1960s. The consequence of such an infection is that sectors such as agriculture and manufacturing become less competitive in world markets. This creates a "vicious circle" of increased reliance on resource revenues and manufacturing is hard to restore if the resource sector or its revenues fail.

The most evident symptom of Dutch disease is the rapid appreciation of the real exchange rate that is often connected with natural resource booms. When on the base of strongly rising income from natural resource exports a country’s total exports and demand for its currency are increasing rapidly, its real exchange rate will have a tendency to appreciate. This appreciation will increase competitive pressure on domestic exporters in other sectors. The real appreciation of the domestic currency will also increase the purchasing power of domestic consumers in terms of foreign goods, further increasing the pressure on domestic manufacturers through the channel of import competition. Even if factor markets are highly flexible and impediments to adjustment are minimal,

[35] "The Dutch Disease", 1977. *The Economist*, pp. 82-83, November 26, 197dfws7

the speed of appreciation may be such as to increase the cost of adjustment to the new terms of trade.

There are various channels by which conventional tradable sectors may be crowded out by a booming resource sector and the non-tradable sector including: i) increased productivity in the resource sector drives wages up, bidding labour out of the production of the manufacturing sector. Additionally, since natural resource sectors are likely to offer higher returns on investment (by exploiting the resource rent), investment and thus economic growth would tend to be biased towards the resource sector; ii) amplified incomes shift demand from the lagging tradable sectors to non-tradable, where wages will also be pushed up. This spending effect will further drain factors of production out of the non-resource tradable sector. Some researchers may argue that these changes shouldn't be called a disease. They would claim that as long as the net effect on output and employment is positive, this should be seen as an economic adjustment mechanism, adaptation to a new economic structure and newly acquired wealth.

In any case, identifying a case of Dutch disease is not straightforward as: i) the reallocation of employment from manufacturing to services is a general structural trend. It is particularly well-defined in transition economies due to the (former) centrally-planned systems propensity to neglect services and concentrate on industry; and, ii) some real appreciation is characteristic of the catching-up process, as productivity gains in manufacturing are by and large higher in transition economies than in developed ones i.e., the Balassa-Samuelson effect.

Modelling the Dutch Disease: Salter-Swan Model

The term *Dutch disease* -- proper -- is used to designate the appreciation of the real exchange rate of a given (usually resource abundant) country due to inflation arising from resource revenue disbursements, followed-on by over-heating of the economy, high demand for the home currency and appreciation of the nominal exchange rate. One important consequence of this chain of events is a contraction in the non-resource traded sector. Thus "[t]he output of the non-resource traded goods sector is lower than it was initially (Fardmanesh, 1991)."

Currently the phrase is not unambiguous -- the meaning has evolved and changed. In some cases it has taken on a much wider connotation to include all of the detrimental macroeconomic effects associated with the "resource curse"[36]. In other cases the meaning has become much narrower. For example, Sarraf and Jiwanji, (2001) describe it as a "[f]ailure of resource abundant economies to promote a competitive manufacturing sector".

Corden and Neary, (1982) catalogue the different Dutch disease methodological insights, dividing the effect of a resource led economic expansion into a "resource movement effect" and a "spending effect". The resource movement effect pulls factors of production out of other productive areas, consequently resulting in increased wages and contraction in the other sectors. The "spending effect" materialises as the extra spending moves demand up in both sectors of the economy. As the prices of tradables are determined at the international market, higher demand results in increased

[36] In fact this inclusive approach is the one that we believe to be the most appropriate.

imports; conversely, the prices of non-tradables have to rise relative to tradables; thus shifting resources from the tradable to the non-tradable sector.

We note that the “resource movement effect” as a feature of the Dutch disease is highly relevant for the transition economies in general and those which are resource-abundant in particular. As the process of transition has effectively destroyed the old productive base and a new and private tradable sector is still in a process of establishment. Little empirical work has been done in this important area.

Salter-Swan Model

We illustrate the Dutch Disease transmission mechanism by utilising a version of the Salter-Swan model (Salter, 1959, and Swan, 1960) of a two-sector economy with resource abundance, abstracting from capital accumulation, international investment and financial assets. The model can be considered as an expansion of PST and the Rybczynski theorem.

Its function is twofold -- first, it facilitates the understanding of the functions and relations of the key factors bringing about macro-economic imbalances; and, second it makes available a structure within which the underlying principles and the expected outcomes of policy interventions can be analysed. The model draws a distinction between “tradable” and “non-tradable” goods and services. Tradables are composed of all goods and services produced in an economy subject to import, export, or would-be so. Non-tradables are these goods and services that do not leave the country, because of their practically non-tradable nature, e.g. haircuts, public services, construction, highly perishable products; or due to prohibitive transport costs.

Tradables and non-tradables differ most-importantly by their price formation. The resource / oil economy is treated as a small open economy; prices of tradables are assumed to be determined by the respective world market price converted by the exchange rate into home market prices. The prices of non-tradables are supposed to be created by local forces of demand and supply. Practically, a large group of commodities cannot be clearly consigned to one of the divisions but are characterised by various levels of "tradability". The same merchandise, even in the same country, may be a tradable at one location and non-tradable at another. Many goods find their position in between the precise tradables and non-tradables classification, affecting the process of price formation. The resource / oil revenues are integrated in the model as net transfers from abroad and the oil sector being an enclave in nature does not feature separately in the model.

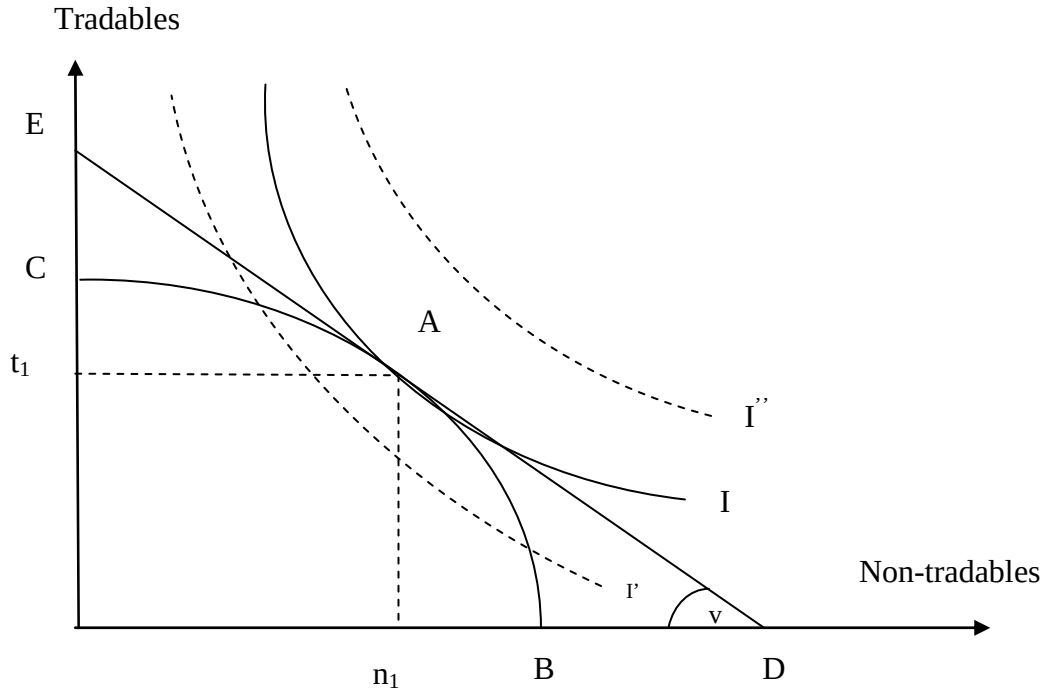
This model provides a framework for analyses of important aspects of price formation and production side reactions, based on the following assumptions:

i) The economic system produces three categories of goods: exportables (x), importables (m), and non-tradables (n); ii) P_x and P_m designate the prices of exportables and importables respectively; the prices of exportables and importables are formed on the international market, whereas price determination of non-tradables P_n is subject to the interaction of home supply and demand; iii) The ratio ($P/_xP_m$) represents the terms of trade and they are fixed, hence, exportables and importables can be pooled into a single amalgamated traded good (t) with price P_t; Consumption is either directly related to locally produced importables, or not directly by manufacture of exportables then exchanged for imported consumer goods of the same price; iv) Exportables are not used internally; importables and non-tradables are just for final consumption; and, v) Markets (factor and product) are characterised by perfect competition with the economy producing at the production frontier. It is assumed that labour is fully mobile in the short run – it reallocates between sectors depending on

the state of the market, whereas capital has sector-specific properties in the short run and is only alterable in the long-run.

Figure 38, below, depicts an equilibrium position as a preparatory point of the analysis. Horizontal and vertical axes show the quantity of tradable (t) and non-tradable goods (n) produced and consumed in a given economic system. The BC curve corresponds to the production transformation curve; representing the locus of points of all potential mixtures of tradable and non-tradable goods that could be produced in a given economic system, subject to resources, factors of production and technologies available. It portrays, as well the production frontier, i.e., the line tracing the combination of maximum production output at full employment and full utilisation of productive resources.

Figure 38: Macroeconomic equilibrium in the Salter-Swan Model



If the entire productive resources were committed to producing non-tradables, the economy would

end up with output of quantity B; if only tradables were to be produced, the output C can be reached. If resources are committed to producing both types of goods, then any mixture given by n and t as shown on the arc BC, (e.g., the combination of t_1 and n_1, determining point A) can be attained. In the cases where the point lays within the curve BC – the production resources are underutilised and the economy is producing below its potential. In the short-run the curve is fixed, whereas in the long run it can shift in both directions due to changes in technology or endowments of resources. All notation is in real terms.

The diagram contains a sample from an indefinite number of indifference curves – from I to I^n though for presentational purposes we do not go beyond I''. Here the indifference curve depicts consumer's preferences among tradables and non-tradables for a given utility level. I" indicates a superior satisfaction level than I, and I' indicate a lower level of utility. The indifference curves are convex based on the concept of diminishing marginal utility. Rational economic behaviour entails that consumers will try to achieve the uppermost potential level of utility within the budget constraint (DE); the DE line stands for the mixture of both goods -- tradable and non-tradable obtainable, and its slope is given by the relative price of traded goods in terms of non-traded goods v, i.e. $v=P_t/P_n$. If the entire expenditure were committed to non-tradables, the magnitude D could be bought at the given prices, i.e., quantity E, if the entire income is spent on tradables. This is not possible, as the maximum quantity of non-tradables produced is given by the point B, and the maximum amount of tradables is given by the point C.

Only at a single point (A) does the budget line touch the production possibility frontier, determining the n_1 quantity of non-tradable goods and t_1 quantity of tradables, whereby realising the maximum

level of welfare with the given level of income. In short, point A represents a theoretical optimum, where: i) demand for tradables (t) and non-tradables (n) equals supply; ii) welfare is maximised for a given income; iii) the factors of production are fully employed; iv) foreign exchange rate is in equilibrium; v) demand for tradables equals output, and imports equal exports; and, vi) the demand for non-tradables equals their supply.

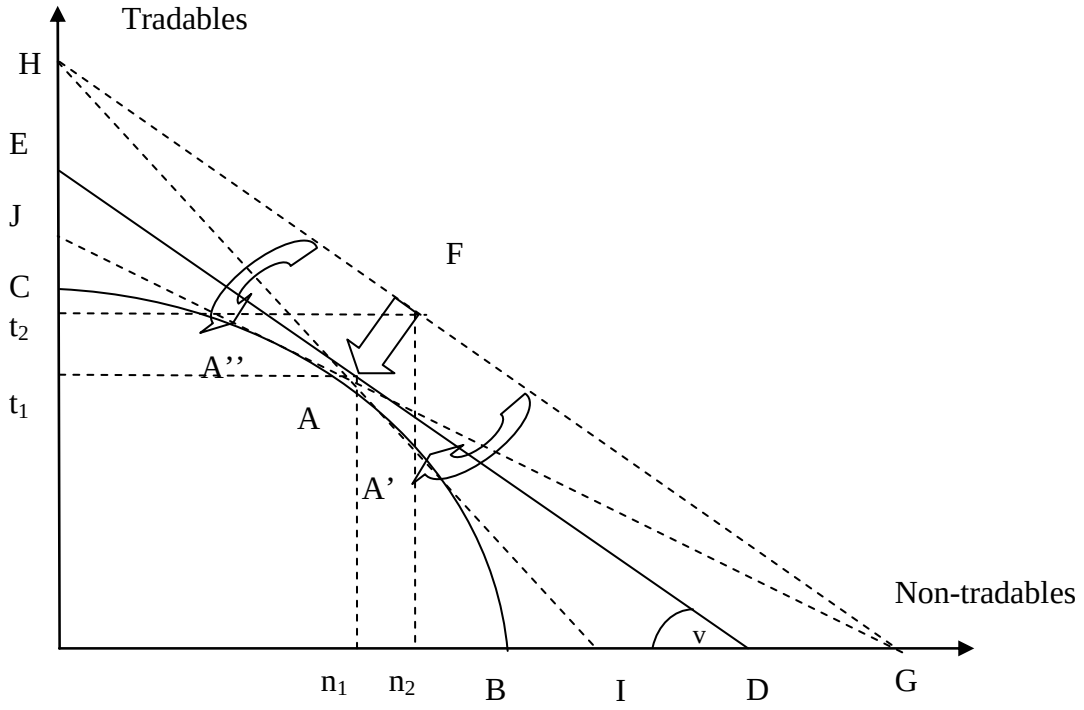
Macroeconomic imbalances and adjustment to equilibrium

Suppose that an increase in government spending brings about a budget deficit, financed by monetary expansion, extending aggregate demand to point F (see Figure 39, below). Hence, demand exceeds output of both (t_2-t_1), i.e., tradables and (n_2-n_1), i.e., non-tradables. Thus, the line GH is the relevant new expenditure line, drawn parallel to the DE line. At each point to the right of point A there would be excess demand for non-tradables; at each point to the left of A an excess demand for tradables will exist. As a result of this domestic prices tend to go up. Surplus demand would drive prices of non-tradables and tradables up albeit through different transmission mechanisms (direct demand-pull effect and indirect effect working through the increased demand for foreign currency in a floating exchange rate setting). The new equilibrium would be re-established through increases in nominal demand and nominal income, while total output remains the same. In terms of the chart the expenditure curve reverts to its initial location.

If the composition of demand for tradables and non-tradables is altered due to, say expansionary fiscal/monetary policy, comparative prices would change (inflation rates of tradables and non-tradables would be different) and bring about an evolution in the structure of production in the direction to the commodities with relatively higher prices. If excess demand for non-tradables

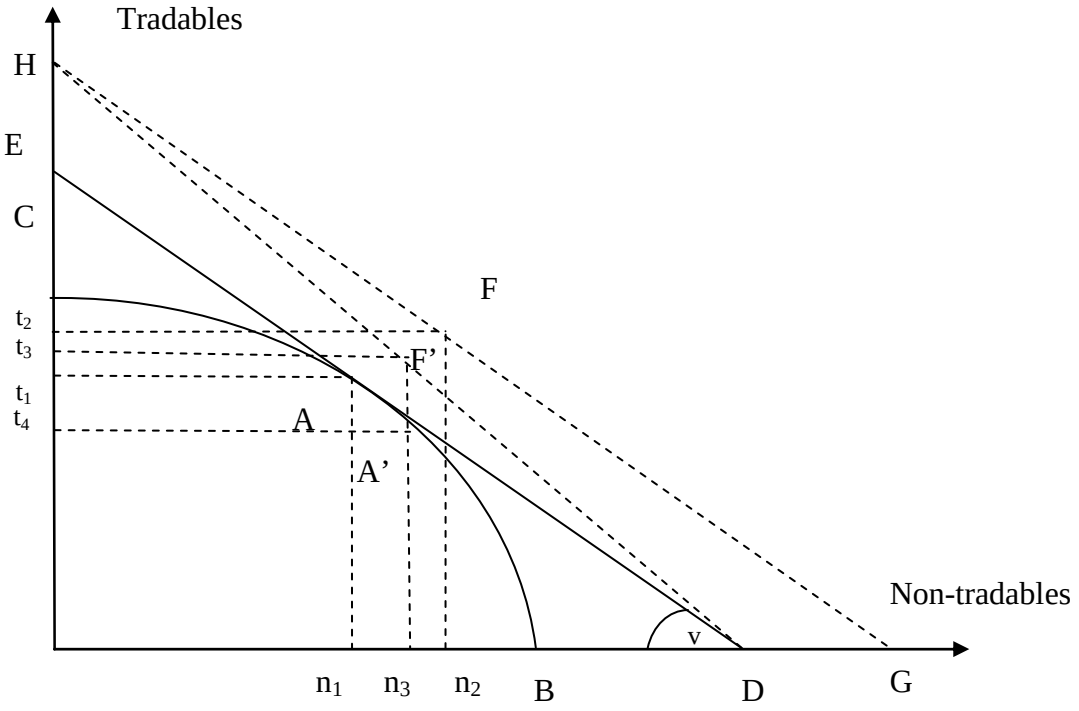
materialises, the budget line would revolve clockwise at point H until the IH line is depicted, with the new equilibrium point at A', where extra non-tradables and fewer tradables are produced in comparison to point A. If excess demand for tradables is experienced, the budget line would rotate counter clockwise in point G to line JG, establishing the new equilibrium point at A", changing production activities from non-tradables to tradables.

Figure 39: Macroeconomic change due to excess demand



Macroeconomic disequilibrium due to large transfers of resources from abroad

Figure 40: Departing from macroeconomic equilibrium – the Dutch disease



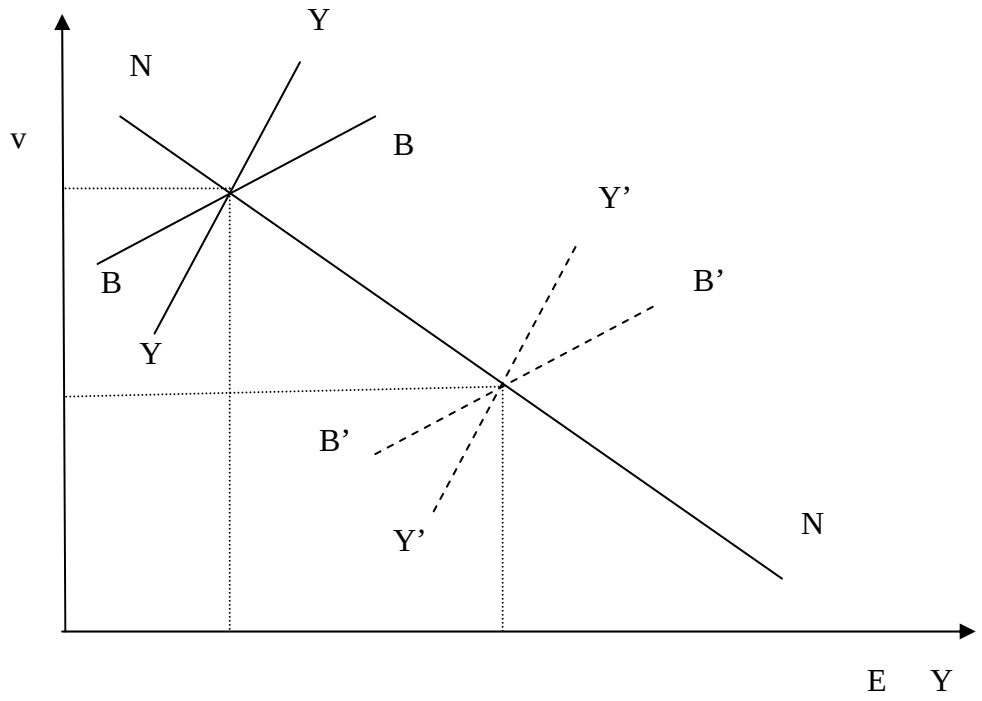
Next we present the case of a disturbance in the external balance due to a large transfer of resources from abroad in combination with fixed exchange rate system in place. Higher natural resource revenue boosts national income and demand. A rise in real spending would raise both demands for tradable and non-tradable goods (assuming both types of good are normal).The equilibrium price of non-tradables increases as a result of an increase in demand from A to F, but the domestic prices of tradables remain unchanged due to the fixed exchange rate policy. Owing to the price increase of

non-tradables the expenditure line H revolves to the location DH. The aggregate demand is at the equilibrium point F' where a certain quantity of non-tradables (n_3) and tradables (t_3) are sold.

As a result of the relative prices correction, up for non-tradables in relative terms, output of non-tradables expands from n_1 to n_3 and reaches equilibrium with the demand for non-tradables. Regarding tradables, demand moves from t_1 to t_3, although production experiences a reduction from t_1 to t_4. At such state the demand for tradables (F') exceeds production by (t_3-t_4), followed by a subsequent corresponding deficit in the current account. Hence, the short-run effects of high resource income are subsequent appreciation of the real exchange rate -- a higher relative price of non-traded goods (P_n) in relation to traded goods (P_t) – with a decline of the tradables and a simultaneous extension of the non-tradables segments. A higher relative price of non-traded goods Pn sets in upward motion the price of the marginal product of labour in the non-traded sector; thus employment in the traded sector must go down in order to drive up the marginal product of labour in the traded sector. Labour shifts from the exposed to the sheltered sectors. This increases consumption expenditure and output growth of non-traded goods. F' can only be supported and possibly sustained – only in the short run – by the provision of foreign exchange reserves.

This analysis could also be conducted in terms of the supply side and the demand side of the (resource) economy combined. Below (Figure 41) we show the combinations of expenditure levels and relative prices (adjustment) following the transfer of resources from abroad.

Figure 41: BB-NN Model



Where, Y – total output

E – real expenditure in terms of non-traded goods

$D_t = D_t(v, E)$ -- demand function for traded goods

$D_n = D_n(v, E)$ -- demand function for non-traded goods

BB -- $Y_t(v) = D_t(v, E)$; schedule along which there is external balance, demand for traded goods equals supply (external equilibrium)

YY -- $Y = Y_n + vY_t$; schedule of total output in terms of non-traded goods for each relative price

NN -- $Y_n(v) = D_n(v, E)$; schedule along which there is non-traded goods market equilibrium. The schedule is drawn with a negative slope assuming that the substitution effects dominate the income effects

The diagram shows that when the equilibrium price of non-traded goods rises (i.e., v declines), this translates into real exchange rate appreciation. The rise of the price of the non-traded goods creates excess supply that has to be compensated by an increase in spending to maintain equilibrium in the market.

Conclusions from the Dutch disease model analysis

The model provides a framework for undertaking analysis of the major factors causing structural imbalances and the appropriate application of macro-economic policies in mitigating the dynamics of macro-economic disequilibrium. Despite the conclusions which the model provides, critical analysis and judgement need to be applied -- as always -- before using it for policy formulation. The factors that should be considered include:

- Why might the prices of tradables and non-tradables not behave as assumed in the model? Several possible reasons: economies of scale in export and import, trade barriers, effects of coincident correction of prices and / or quantities by a group of countries, imperfect market information;
- The outputs of different economic sectors are neither completely tradable, nor entirely non-tradable, they just have different degrees of tradability;
- The level of tradability varies over time, on the basis of the degree of price differences;

- Imported goods have a quantity of local value-added ingredient in their final consumer price, and non-tradable goods have some imported components;
- Market monopolies in export and import sectors involve particular price formation; to remain competitive an importer may accept a reduction in his monopoly margin and increase the price less than expectations just based on the level of currency appreciation. Then again, an exporter may retain a share of the extra profit accruing from currency devaluation and not pass it on;
- The setting of the model is comparative static, and does not allow for dynamic mechanisms or phenomena, such as the alteration of capital and price; and,
- The analysis is partial equilibrium in another sense: the size of the country is assumed to be small, but international repercussions may follow.

Real Exchange Rates Determination -- Purchasing Power Parity (PPP) -- and Balassa-Samuelson Hypothesis

The PPP was the simple idea, apparently easy to figure out and easier to spread, articulated by the Swedish economist Gustav Cassel (fundamentally developed by David Ricardo[37]). The modern form of the PPP appeared just at the time, when it was needed; after the world currencies were debased from gold (following the World War I) a mechanism was needed to determine their (previously gold content based) exchange rates. The suggested straightforward definition would sound like this: the exchange rate between two currencies is determined by the ratio of their purchasing powers (command over goods and services) in their respective country. “I propose to call this parity “the purchasing power parity”. As long as anything like free movement of

[37] Keynes (1923)

merchandise and a somewhat comprehensive trade between two countries take place, the actual rate of exchange cannot deviate very much from this purchasing power parity (Cassel, 1918)."

Three corollary points to be made:

- PPP implies convergence between market rates of exchange (MER) and PPPs; what converges to what? This question should be treated very carefully. While it is easy to reply that the market rate of exchange should be moving towards the "equilibrium" (PPP) exchange rate, this would confuse the names and the substances of these concepts. In fact the PPP is time-varying; hence adjustment towards "equilibrium" can be attained by changes in MER, PPP or mutually[38].
- PPP depends on the law of one price, which derives from the expected work of market forces driven by arbitrage, i.e., if the PPP and MER are too far from each other there would exist a profit opportunity, which will be covered by international trade.
- Cassel's PPP hypothesis and the widely used technical conversion factors – PPPs – for comparative analysis among countries are different concepts. The former is a theoretical paradigm and the latter is a statistical index providing a general basis for comparison of the strength of two monetary units in common currency.

[38] Discussing PPP Keynes observes: "At first sight this theory appears to be one of great practical utility; and many persons have endeavoured to draw important practical conclusions about the future course of the exchanges from charts exhibiting the divergences between the market rate of exchange and the purchasing power parities, -- undeterred by the perplexity whether an existing divergence from equilibrium, will be remedied by a movement of the exchanges or of the purchasing power parity or of both." (Keynes, 1923)

However, empirically the evidence fails to sustain the PPP hypothesis. The large empirical literature endeavouring to deal with these issues reaches diverse conclusions. Rogoff (1996) provides a useful overview of the extensive research in this area and gives the name of “purchasing power parity puzzle” to the frustrating empirical results obtained regularly (“remarkable consensus”) when testing the Purchasing Power Parity (PPP) doctrine. These results imply a too long time -- three to five years (HL: half-life) -- needed for convergence despite the high volatility of real exchange rates. This is to say that, at most, the real exchange rates very slowly tend to return to their means. Moreover, recent research (e.g., Lopez et al, 2013 and Gadea and Mayoral, 2013) questions if this estimated very long adjustment period is not indeed too low “The probability that the HL lies in the so-called Rogoff's puzzle interval (3-5 years) is quite small (around 21%).” (Gadea and Mayoral, 2013) In fact Gadea and Mayoral using a dataset for 20 countries for the period of 1850 to 2004 find that the median values for the HL are larger than 10 years for 10 countries and the probability that the HL is less than 10 years in the entire sample is 55 per cent. One potential (and well exploited) road to finding a solution to this puzzle is the Balassa-Samuelson hypothesis.

The Balassa and Samuelson hypothesis -- BS -- (Balassa, 1964, Samuelson, 1964) offers in general a theoretical justification of the long run trends in real exchange rates in relation to productivities and prices. Their natural point of departure is the Salter-Swan (dependent economy) model, i.e., taking into consideration the important real world feature of having both tradable and non-tradable goods. BS states that if a given country’s productivity in producing tradable goods compared to its productivity in making non-tradable goods and services rises more rapidly than in a (certain) foreign country, then the home country real exchange rate will experience appreciation. Thus if the productivity of factors of production grows faster in the home country tradable sector, then the

relative price in the non-tradable sector should rise. Evidently, this would cause a faster rate of domestic inflation relative to the country with the slower rate of productivity growth and as a result the real exchange rate would appreciate. Or seen from the perspective of the income terms of trade approach the booming sector (e.g., high oil premiums) originates larger spending on both tradable and non-tradable goods and services. Given that the tradable products are linked to the international market by the price taker (small country) supposition, the increased demand would generate higher imports. However, the prices of the non-traded goods would have to rise as they are determined by the interaction of domestic supply and demand, resulting in higher inflation. Consequently, the real exchange rate of the country under consideration would appreciate.

The existence of the BS effect is corroborated by substantial empirical support, though its strength is commonly found to be quite small in comparison to the theoretically expected one. While notionally, it may well be expected that the magnitude of the effect of relative productivity might be similar (at least) to the share of non-tradables in the GDP (generally found to be higher than 0.5), Ricci et al (2008), using a sample of 48 countries (containing both industrialised and emerging markets countries) over the period 1980-2004 estimate a coefficient of domestic productivity of 0.2 "[o]n the low side with respect to the theory, but in line with other studies."

The net barter terms of trade (included as well into their regression analysis) is estimated to have a significant, positive effect of about 0.55, enhancing the BS effect. This represents an uncharacteristic result, as the standard outcome in the international macroeconomics literature tends to advocate that increase in the productivity of domestic tradable goods is expected to lead to a decline of the terms of trade, e.g., Obstfeld and Rogoff (1996). As well, Nahuis and Geurts (2004) -

- using a sample of 25 OECD countries covering the 1971-2002 timespan -- provide support for the existence of such a negative effect from productivity expansion via competition forces to lower prices[39]. However, other studies, e.g., Corsetti et al. (2005) support this (reverse) conclusion: "Following a shock that increases permanently U.S. labour productivity in manufacturing (our measure of tradables) relative to the rest of the world, U.S. relative output and consumption increase, while the real exchange rate appreciates. Second, the same increase in productivity improves the terms of trade, as suggested by our model under the negative transmission."

Still, a further recent study by Bordo et al (2014) after solving a version of the conventional BS model for 14 countries over more than a 100 year period (1880-1997) and distinguishing "[f]our sub-periods representing different regimes: 1880-1913 (the classical gold standard), 1914-1945 (the wars and interwar), 1946-1971 (BrettonWoods), and 1972-1997 (managed floating)", obtain (the usual) values for the productivity differential (over the entire sample) in the range of 0.13 to 0.22. However, "Estimates of the coefficients for the subsamples show considerable variation across periods and are even harder to explain by the conventional Balassa-Samuelson model. Estimated values are positive but small (below 0.25) in the gold standard period; are negative (between -0.17 and -0.42) in the interwar period; have an ambiguous sign (range from -0.33 to 0.12) in the Bretton-Woods period; and are positive, and on average, larger (within a wide range from 0.2 to 1.18) in the post Bretton-Woods period. The conventional model or its modification does not suggest an explanation of why the productivity coefficient would be negative in some periods and why it should differ so much from one period to another." In trying to find a solution, they offer an

[39] "Growth of productivity has a significant effect on relative export prices. Within a year, about a quarter of productivity growth in a country is translated into lower export prices. In a 4 year period one per cent growth in productivity is associated with 0.59 per cent deterioration in the terms of trade (Nahuis and Geurts, 2004)."

interesting calibrating exercise by "correcting" the productivity effect for the elasticity of substitution of home and foreign tradables (Armington elasticity) and for home bias (share of home goods in the domestically traded goods basket, minus the share of the home goods in the foreign goods basket of traded goods). Substituting for values of the Armington elasticity in-between 1 and 2; home bias values ranging from 0.4 to 0.8; and the share of nontraded goods in GDP of 0.65 they "[a]re capable of accounting for not only large negative values of the productivity coefficient estimated for the interwar period, but also large positive values generally estimated for the post Bretton Woods period." Hence, they conclude that "The Balassa-Samuelson theory modified to account for the terms of trade effect has the potential to explain the observed variation in the productivity effect over a long period."

Another proposed solution is sought in a combination of the three factors: TFP differential; real interest rate differential and, the real price of gold, "[r]epresenting real shocks, monetary shocks, and shocks to the global financial system (Kakkar and Yan, 2014). Collecting data for 15 OECD countries plus China, they utilise cointegration procedures and conclude that "Taken together, the evidence […] is quite favourable to the augmented Balassa-Samuelson model. […] The visual evidence […] shows a close link between actual and fitted values of the real exchange rates for most countries…"

These are general theoretical observations and they should be examined carefully within any historic and country context. Hence, we are going to implement empirical analysis for Azerbaijan based on the Balassa – Samuelson model to try to find practical support for or against the symptoms of the Dutch Disease.

Empirical Assessment of the Real Exchange Rate of Azerbaijan

Among other indicators real exchange rate misalignments play a prominent role in defining competitiveness or the potential ability of Azerbaijan to produce goods and services of international quality standards at least as effectively as its trading partners.

The derivations of the Balassa–Samuelson effect endure different logical and empirical specifications that may have important economic implications. One essential issue associated with Purchasing Power Parity (PPP) doctrine is the question of causality. In general, all economic variables are mutually dependent, so it is difficult to establish unilateral causation. Still for practical purposes, it is feasible to argue and empirically determine the prevailing causation, i.e., that prices determine exchange rates or that exchange rates determine prices ($P \rightarrow ER$; $ER \rightarrow P$). This is an essential but difficult question to answer.

Given that the exchange rate moves because of differential inflation in two countries -- causality from P to E -- we have arrived at a theory of exchange rate determination. In this case, home and foreign prices are the driving force. If home prices are changing due to exchange rate "undervaluation" or "overvaluation" -- causality from E to P -- we have a theory of price determination. In this case, the independent behaviour of the exchange rate is the cause and the inflation or deflation is the result.

The two alternatives have very different policy implications. Under the first option, the exchange rate is an adjusting variable and its movement is accepted as an equilibrating force. If the second

view dominates, the exchange rate movement would be seen conventionally as a destabilizing factor for the domestic economy. This passive movement of domestic prices in response to an exchange rate shock is called the "pass-through" effect.

In large and relatively balanced national economies, pass-through may be rather small, e.g., Powers and Riker, (2013), estimate median pass-trough for the US economy import prices of 0.44); hence domestic inflation is no more than affected by exchange rate movement. But for small open economies, in particularly with fixed exchange rates, it may be quite high. Beirne and Bijsterbosch, (2009) utilising monthly data (January 1995 to April 2008) for the (then) nine central and eastern European EU members and applying both cointegrated VAR and impulse responses based on VECM conclude that the exchange rate pass-through is around 0.6 on average based on cointegrated VAR and around 0.5 based on the impulse response. More interestingly their cointegration results on exchange rates pass-through illustrate that “[f]or the four fixed exchange rate regime countries (Bulgaria, Estonia, Latvia, and Lithuania) it averages 0.758. Moreover, for each of these countries, a hypothesis test for full pass-through cannot be rejected.”

The pass-through effect is in the main larger for primary commodities, e.g., oil and minerals, than for manufactured products. Also, pass-through is smaller for regulated goods and countries with various trade restrictions than for free trade products and open economies.

Furthermore, there is a certain confusion within the realm of exchange rates and relative prices interrelations which could be illustrated by the following assertions:

Higher inflation countries should experience a high rate of real exchange rate depreciation -- so, under (the absolute form of) PPP the real exchange rate is one (or constant under the relative version). Thus any differences in inflation rates would not affect real exchange rates, but would be precisely matched by corresponding changes in the nominal exchange rate (through arbitrage). This to say:

eq. 28 $$PPP = \frac{p^* e}{p} = 1$$

eq. 29 $$RER = \frac{p^* e}{p}$$

where, p^* -- foreign currency price level

p -- domestic currency price level

e -- nominal exchange rate

RER – Real exchange rate (in terms of domestic price of foreign currency)

A higher general price level relative to other countries, ceteris paribus, means an appreciation of the real exchange rate – yes, under the BS hypothesis. This to say:

--Poorer countries have a lower price level;

--Improvements in productivity in the tradable sector relative to the foreign country appreciate the RER; and,

--Improvements in productivity in the non-tradable sector relative to the foreign country depreciate the RER.

But the subtle nature of this theory has been well understood and fully acknowledged by both authors credited with its formulation. As Balassa (1964) points out “Interest in the doctrine arose whenever existing exchange rates were considered unrealistic and the search began for the elusive concept of equilibrium rates.” Additional clarification is provided by the statement of Samuelson (1964) “PPP is a misleading, pretentious doctrine, promising us what is rare in economics, detailed, numerical predictions.”

Before we begin the empirical analysis we look into the various sources of the real exchange rates (PPPs) data in particular.

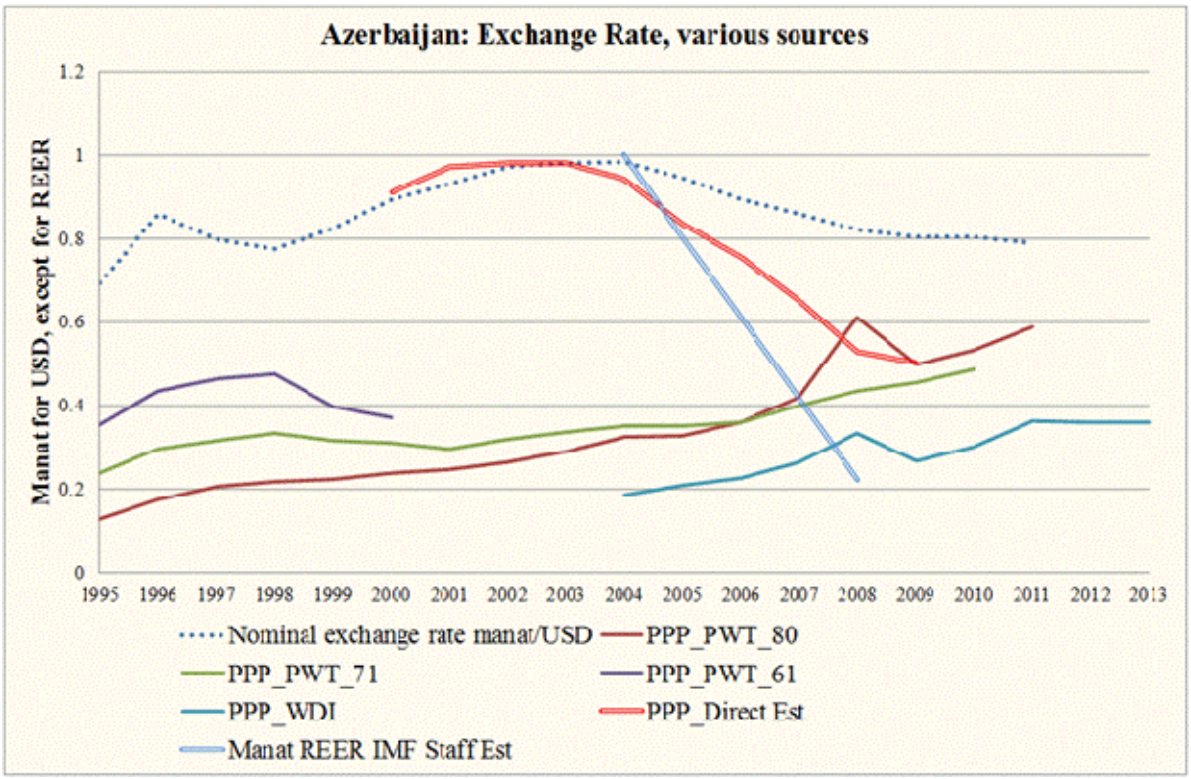
The real exchange rate (RER) is calculated as the nominal exchange rate adjusted for relative price movements. Different alternatives for calculating RER are available, depending on which prices are being used – consumer prices, product prices, wholesale prices or unit labour costs – and also depending on whether bilateral or multilateral measures are used. The most widely used measure of RER is the CPI based one.

Figure 42, below depicts the data series available from various sources, including: the three different editions of the Penn World Tables (PWT 61; 71; and, 80), one from the World Development Indicators (WDI, World Bank), and one based on direct estimates by the author. Plus,

we present the partial, but important data of the real effective exchange rate (REER) provided by an IMF analysis[40] to inform our judgement.

It is obvious that while there is a distinct difference between the three versions of the PWTs and the WDI, these series seem to exhibit a more or less common profile, but all of them diverge significantly from the direct estimate and the IMF REER. The difficulties with the quality of data and its availability for the former centrally planned economies, especially during the earlier years of transition is well known. On the positive side, it appears that from the year 2008 onwards all data sources begin to move on the whole in parallel.

Figure 42: Azerbaijan, nominal and PPPs exchange rates data



40 IMF Country Report No. 14/159, Republic of Azerbaijan, June 2014

In continuing our analysis, first we are going to test whether exchange rates and productivities are co-integrated, this is to say share the same trend.

Problems related to spurious regression could arise from potentially mixed order of integration of the employed series and from the lack of long run stable relationships among the variables of the model. Hence, stationarity of variables is a major concern in time series analysis since non-stationary variables are not mean preserving leading to invalid standard errors and related problems with hypothesis testing and other standard inferential techniques. We use the unit root test – The Augmented Dickey Fuller test (ADF) – to check the data generating process statistically for trend stationarity against difference stationarity. The test (ADF) when performed as follows is a simple t-test but with different critical values from the standard normal distribution:

eq. 30
$$\Delta Y = \alpha + Y_{t-1} + \sum_{i=1}^{k} \Delta Y_{t-k} + u_{1t}$$

The lagged first difference terms are added to remove any serial correlation in the error term. First we test the real exchange rate series (RERSM). The test cannot reject the null hypothesis of a unit root. The ADF statistic in absolute value is below its 95 per cent critical values of -3.2197 for up to the third order of augmentation. The values are reported in Table 20 below. Three of the model selection criteria (AIC, SBC, and HQC) suggest that the correct order of the ADF regression is around one, with the maximum log-likelihood (LL) selecting a higher order.

Next we test for a unit root in the first-difference of same time series (differencing a non-stationary variable is commonly expected to result in a stationary variable). However, all values of the ADF

statistics are below the 95 per cent critical value. The model selection criteria suggest that the proper order of the regression is between two and three. Based on the outcome of the test, we cannot reject the hypothesis that the first difference of the real exchange rate between the US Dollar and the Manat has a unit root. Simultaneously the ADF test seems to suggest that RERSM is neither level nor first difference stationary, in other words, the order of integration is not an integer, signifying that the "standard" choice between unit root I(1) and level stationary I(0) process is in doubt.

Table 20: Unit root test for the variable real exchange rate (RERSM) and for the first difference of the variable real exchange rate (DRERSM)

The Dickey-Fuller regressions include an intercept but not a trend

10 observations used in the estimation of all ADF regressions.
Sample period from 1999 to 2008

	Test Statistic	LL	AIC	SBC	HQC
DF	.48060	4.2381	2.2381	1.9355	2.5700
ADF(1)	-.96710	9.4388	6.4388	5.9849	6.9367
ADF(2)	-.53537	9.4892	5.4892	4.8840	6.1531
ADF(3)	-.36369	9.4907	4.4907	3.7342	5.3205

95% critical value for the augmented Dickey-Fuller statistic = -3.2197
LL – Maximized log-likelihood AIC – Akaike Information Criterion
SBC – Schwarz Bayesian Criterion HQC – Hannan-Quinn Criterion

DRERSM -- The Dickey-Fuller regressions include an intercept but not a trend

9 observations used in the estimation of all ADF regressions.
Sample period from 2000 to 2008

	Test Statistic	LL	AIC	SBC	HQC
DF	-.13622	16.9574	14.9574	14.7602	15.3830
ADF(1)	.96637	18.8029	15.8029	15.5070	16.4413
ADF(2)	2.7331	23.0605	19.0605	18.6660	19.9117
ADF(3)	2.2835	23.2794	18.2794	17.7863	19.3434

95% critical value for the augmented Dickey-Fuller statistic = -3.2698

Next we test for unit roots in relative productivity time-series (RPR), i.e. the ratio between GDP and employment of Azerbaijan and United States. The null hypothesis that this variable is difference stationary (unit root) against the alternative that it is trend stationary cannot be rejected for all orders of expansion. All model selection criteria are suggesting that the suitable order of augmentation is between one and three. Further we test for unit roots in the first difference of RPR. In this case for all orders of augmentation (three) the absolute values of the ADF statistics are well below the 95 per cent critical value of the test and thus the hypothesis (unit root) cannot be rejected again.

Table 21: Unit root test for the level (RPR) and first difference (DRPR) of the variable relative productivity

RPR -- The Dickey-Fuller regressions include an intercept but not a trend

10 observations used in the estimation of all ADF regressions.
Sample period from 1999 to 2008

	Test Statistic	LL	AIC	SBC	HQC
DF	2.3104	4.3893	2.3893	2.0868	2.7213
ADF(1)	.22155	4.7960	1.7960	1.3421	2.2939
ADF(2)	1.3145	6.6338	2.6338	2.0287	3.2977
ADF(3)	1.3535	7.0685	2.0685	1.3121	2.8984

95% critical value for the augmented Dickey-Fuller statistic = -3.2197

DRPR -- The Dickey-Fuller regressions include an intercept but not a trend

9 observations used in the estimation of all ADF regressions.
Sample period from 2000 to 2008

	Test Statistic	LL	AIC	SBC	HQC
DF	-1.3488	4.6388	2.6388	2.4415	3.0644
ADF(1)	-2.3593	6.6854	3.6854	3.3896	4.3238
ADF(2)	-2.3554	7.7212	3.7212	3.3268	4.5724
ADF(3)	-1.6575	7.8370	2.8370	2.3440	3.9011

95% critical value for the augmented Dickey-Fuller statistic = -3.2698

In the following section we discuss the theoretical basis of our modelling approach.

Above we discerned two main factors relating to real exchange rates, prices and productivities. The first relates to the PPP concept and characterises RER dynamics as a mean reverting, stationary process where shocks and cyclical movements do not have a strong permanent effect. Consequently the RER must tend to revert to its long run equilibrium level rather quickly. The second is associated with the notion of the Balassa-Samuelson effect, claiming that productivity fluctuations have rather permanent effects on the RER and, therefore RER could appropriately be characterized as a non-stationary, long memory, non mean reverting process. It should be borne in mind that it can be problematic to distinguish small trends from "spurious" local trends as a stationary time series under strong dependence can easily look a lot like the former but be essentially the latter and vice versa.

As a result the discussion concerning the subtleties of distinguishing between a mean reverting and “hysteresis-type” process is difficult to bring to a close in any definite way. Importantly, decisions on the order of integration of the series imply certain behaviour about the variable of interest. If stationarity were accepted, it would imply an equilibrium that remains constant despite short-term shocks and government policy. On the other hand, if nonstationarity is assumed, no point of equilibrium will exist. One possible way out, although not without its problems, could be to assume

that PPP is shifting with time. This would suggest that the series under consideration may be non-stationary but also mean reverting, i.e., possibly fractionally integrated of the order I(d)[41].

To accommodate the characteristics of the series in statistical terms and investigate whether a relationship exists between them we need to leave the linear stationary framework and test for cointegration.

Essentially the evidence strongly suggests that the variables are mean reverting, nonstationary: their order of integration is not an integer. To inspect the relationship (and its nature) between the real exchange rate and relative productivity, therefore, we need to address the general problem of defining a cointegrating relationship between series that have different, non-integer order of integration.

The concept of fractional integration is *de facto* introduced by Granger (1986), but not directly put into practical use. Granger (1987) study generalised cointegration class of processes where the fractional cointegration process (i.e., the order of integration of given time series in not an integer) under consideration belongs.

Thus cointegration analysis makes it possible to test for a long-run relationship without putting stringent restrictions on short-term dynamics. From economic point of view fractional cointegration entails the existence of a long-run equilibrium relation, where errors from equilibrium are persistent by mean-reverting.

[41] That is, a fractionally integrated series will have characteristics of both stationary and non-stationary series and have long, rather than short or perfect, memory. They will be mean reverting but only over a much longer period than with a stationary series.

Motivation for using fractional cointegration framework includes: i)The conventional (dichotomous) choice between unit root I(1) and level stationarity I(0) is overly restrictive – many economic time series show sign of being neither I(0) nor I(1); ii) Much more general and flexible apparatus than the traditional approach; iii) Important for modelling wide range of macroeconomic relationships; and iv) The standard practice of taking first differences may still lead to series with a component of long memory behaviour.

If the cointegrating residual has a lower order of integration than the constituent variables the series are said to be fractionally cointegrated. This is to say that two series Yt and Xt, integrated of order d and b respectively, are said to be fractionally cointegrated of order (d,b) if the error correction term represented by the linear combination Zt=Yt-BXt is fractionally integrated of order d-b, where 0<b< d and d>1/2.

The standard cointegration tests (e.g., Johansen's ML) are inappropriate as the ADF tests for stationarity indicate that the variables are characterised by different orders of integration. Therefore, we turn towards the autoregressive distributed lag (ARDL) testing and estimating procedure developed in Pesaran and Shin (1995) and Pesaran, Shin and Smith (2001). This approach allows the regressors to be I(1), I(0), or even fractionally integrated, testing in fact for the existence of a long-run relation between the variables under investigation irrespective of the order of their integration.

The null hypothesis of non-cointegration is tested against the existence of a long-run relationship by computing the statistics (F-statistics) for the joint significance of the lagged levels of the variables in the ARDL model. The asymptotic distribution of this F-statistics is non-standard, but the critical

value bounds are tabulated by Pesaran et al. (1996). If the estimated F-statistic exceeds the upper bound of the critical value band, we can reject the null hypothesis of no long-run relationship between the real exchange rate (RERSM) and the ratio of the respective countries' productivity (RPR).

The test for a long-run relationship between RERSM and RPR is performed using the following version of the ARDL model:

$$\Delta DRERSM_t = \alpha + \sum_{i-1}^{3} \beta_i DRERSM_{t-1} + \sum_{i=1}^{3} \delta DRPR_{t-1} + \lambda_1 RERSM_{t-1} + \lambda_2 RPR_{t-1} + \varepsilon_t$$

eq. 31

The null hypothesis of "no long-run relationship" is defined by $H_0 : \lambda_1 = \lambda_2 = 0$

against, $H_1 : \lambda_1 \neq 0, \lambda_2 \neq 0$ where the relevant statistic is the F-statistic for the joint significance of λ1 and λ2. We estimate (eq. 31) by OLS and then calculate the F-statistic for the joint null hypothesis that the level variables coefficients are all equal to zero.

The results are reported in Table 22 below. Following the Pesaran et al. (2001) bounds testing approach, and given that our sample test statistic exceeds the associated upper critical value (at the 99 per cent level the values are 5.020 and 6.006 respectively) we reject the null in favour of the alternative that there exists a long-run relationship between RERSM and RPR. Theory tells us that the least square estimator of a cointegrating regression is "super" consistent, i.e., converging faster to the true parameter than the least square estimator converges in the common case where the variables are not cointegrated

Table 22: Variable addition test (OLS case)

Dependent variable is DRERSM
List of the variables added to the regression:
RERSM(-1) RPR(-1)
10 observations used for estimation from 1999 to 2008

Regressor	Coefficient	Standard Error	T-Ratio [Prob]
DRERSM(-1)	.080277	.22002	.36486 [.750]
DRERSM(-2)	-.21859	.33477	-.65294 [.581]
DRERSM(-3)	.24296	.19991	1.2154 [.348]
DRPR(-1)	-.19379	.18563	-1.0440 [.406]
DRPR(-2)	.032049	.16916	.18946 [.867]
DRPR(-3)	-.14217	.28697	-.49543 [.669]
RERSM(-1)	-.40990	.083967	-4.8817 [.039]
RPR(-1)	.34164	.087640	3.8982 [.060]

Joint test of zero restrictions on the coefficients of additional variables:
Lagrange Multiplier Statistic CHSQ(2) = 9.4381[.009]
Likelihood Ratio Statistic CHSQ(2) = 28.7909[.000]
F statistic F(2, 2) = 16.7980[.056]

In what follows we estimate the coefficient based as obtainable by the equation (31) above. The long-run coefficients and error correction model (ECM) are estimated by the ARDL specification, where the ECM is estimated by OLS and the lag structure for the ARDL specification of the short-run dynamics is determined by the AIC, SBC, and HQC information criteria.

Table 23: Autoregressive distributes lag estimates (ARDL (2,0) selected based on the Schwarz Bayesian Criterion

Dependent variable is RERSM
11 observations used for estimation from 1998 to 2008

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
RERSM(-1)	1.2293	.19730	6.2308[.000]
RERSM(-2)	-.41254	.17501	-2.3572[.046]
RPR	.13583	.027407	4.9560[.001]

R-Squared	.95826	R-Bar-Squared	.94782

S.E. of Regression	.061084	F-stat. F(2, 8)	91.8206[.000]
Mean of Dependent Variable	1.2736	S.D. of Dependent Variable	.26741
Residual Sum of Squares	.029850	Equation Log-likelihood	16.8938
Akaike Info. Criterion	13.8938	Schwarz Bayesian Criterion	13.2969
DW-statistic	2.7124		

We begin by choosing the maximum order of lags present in the ARDL model to be three, allowing for lags between RERSM and RPR. The Akaike and the Schwartz Bayesian information criteria select the ARDL(2,0), while the Hannan-Quin criterion selects ARDL(2,3). The estimated long-run coefficients from the two models selected on the bases of the above criteria are given in the table below.

Table 24: Estimates of the long-run coefficients -- ARDL approach

1995-2008	Estimation results	
Model Selection Criteria	AIC and SBC- ARDL(2,0)	HQC--ARDL(2,3)
Long-run Coefficient -- RPR	**0.74143**	**0.82482**
t-statistics	[12.0092]	[3.3612]
R-Bar-Squared	0.94782	0.85586
F-satistics	91.8206	30.6877

The point estimates are comparable, though the standard errors obtained using the model selected by AIC / SBC are considerably smaller than those obtained using the model selected by HQC.

The coefficients of mutual determination are very high suggesting that the regressor explains most of the variation in the dependent variable. Further to obtain an approximation of the speed of convergence to equilibrium we estimate the error correction model associated with the long-run estimate.

Table 25: Error correction representation for the selected ARDL model

Dependent variable is dRERSM
11 observations used for estimation from 1998 to 2008

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
dRERSM1	.41254	.17501	2.3572[.046]
dRPR	.13583	.027407	4.9560[.001]
ecm(-1)	-.18320	.042087	-4.3529[.002]

List of additional temporary variables created:
dRERSM = RERSM-RERSM(-1)
dRERSM1 = RERSM(-1)-RERSM(-2)
dRPR = RPR-RPR(-1)
ecm = RERSM -.74143*RPR

R-Squared	.88469	R-Bar-Squared	.85586
S.E. of Regression	.061084	F-stat. F(2, 8)	30.6877[.000]
Mean of Dependent Variable	.036364	S.D. of Dependent Variable	.16089
Residual Sum of Squares	.029850	Equation Log-likelihood	16.8938
Akaike Info. Criterion	13.8938	Schwarz Bayesian Criterion	13.2969
DW-statistic	2.7124		

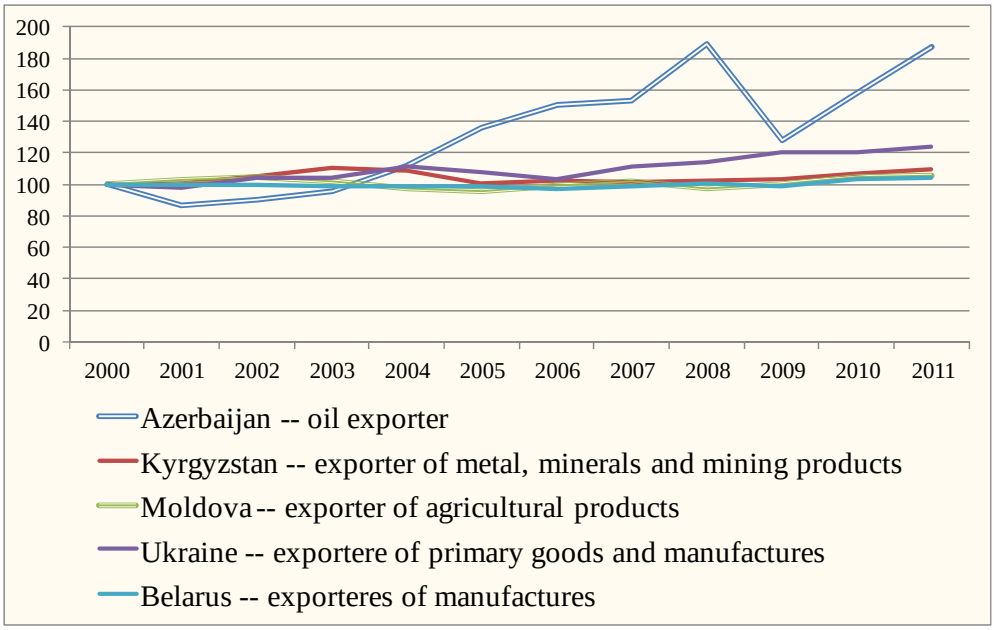
The error correction coefficient (AIC and SBC, based model), estimated at -0.18320, has the correct sign, is highly statistically significant and suggests that the economy's half-life return to equilibrium would take around 3.4 years. This is to say that around 18% of the gap between the long-run values of the variables is closed every year. Consequently, it would take a long time for the equation to return to its equilibrium once it has been shocked. Our finding confirms the validity of the B-S effect for Azerbaijan: i) poorer countries have lower price levels; and, ii) improvement in productivity in the tradable sector (relative to foreign country) appreciates the exchange rate.

As Azerbaijan’s economic growth (and, it appears, productivity) is largely driven by the value of oil exports our results are a clear sign of Dutch Disease -- huge oil revenues cause swift real exchange rate appreciation, leaving the non-oil tradable sector (including manufacturing) unable to compete,

consequently its output (as a share of GDP) declines and the country is *de facto* on the path to deindustrialisation.

If we are to examine the terms of trade developments in Azerbaijan (in comparison with other CCE countries) over the recent past (see Figure 43, below), in fact, they clearly strengthen the productivity effect.

Figure 43: Net barter terms of trade of selected CCE countries (2000-2011)



Furthermore, it should be noted that: i) the changes in the terms of trade diverge significantly across CCE countries; ii) This difference depends to a great extent on the product composition of their respective exports and imports; and, iii) the difference in the impact of the terms of trade changes on the evolution of the purchasing power of exports depends on the speed of export volume growth.

Concluding remarks

Clearly the entire subject of what creates a “curse” rather than a “blessing” and how to bring about the second and avoid the former is a particularly complex area for discussion. The literature is divided on both causes and cures although there is a growing understanding that it has a great deal in common with the quality of governance and the answer is most likely to be found within the intersection area of macroeconomic analysis and political economy.

This chapter advances the following perspective: i) the literature on the “resource curse” provides substantial evidence that natural resource abundance is associated with a range of negative development outcomes, though this evidence is not conclusive; ii) current explanations of the “resource curse” do not sufficiently account for the role of the internal socio-economic forces and the external political and economic background; iii) recommendations for counteractive policy measures in alleviating / preventing the resource curse have not taken genuinely into account the issue of political feasibility; and, iv) academics have been too mechanistic in their approaches to the “resource curse” issues, while the attention needs to be centred on understanding the subtleties and specificities related to the variety of resource abundant countries and the connected policy lessons. E.g., the currently (Dec, 2010) unfolding political and humanitarian crises show that the appearance of political and economic stability in some Middle-East countries, made possible in part by rising government expenses on their own security forces, provision of significant subsidies on energy to final consumers, enhanced welfare payments, expanded public employment and reduced taxes, failed to mask a significant failure to diversify their economies, alleviate increasing income inequality, and circumvent the discontent (civil uprising) of their citizens.

Avoiding the resource curse – theory and practice

Attaining sustainable resource-led economic growth is not an easy task and inevitably involves competent industrial and trade policies. Collier and Goderis (2007) find that although resource dependent economies tend to suffer from a decline in production in the non-resource sector, it is avoidable. Trade and well developed financial and institutional governance can help dissolve the potential 'resource curse" impact on growth. "We find strong evidence of a resource curse. Commodity booms have positive short-term effects on output, but adverse long-term effects. The long-term effects are confined to "high-rent", non-agricultural commodities. Within this group, we find that the resource curse is avoided by countries with sufficiently good institutions." "These findings are consistent with recent theory that point at inefficient redistribution in return for political support as the root of the curse but also lend some support to the large Dutch disease literature. In addition, the results support the more general idea that commodity booms lead countries away from productive activities and provide incentives for non-productive activities, such as rent-seeking, lobbying, or public sector employment."

Lewis (2011), illustrates the case of resource rich Botswana, where as a result of good governance its resource rents were invested into modern infrastructure and human capital, therefore preparing the ground for diversifying its economy and turning the potential curse into a prospective blessing – demonstrating that resource dependence is having a negative impact on economic growth only when the quality of institutions is worse than a given critical level. Di John (2011) "[a]lso identifies some decisive factors that help determine the blessing threshold-below which the risk of a resource curse may be very high-in mineral and fuel abundant developing countries." In fact, "Countries

rich in natural resources constitute both growth losers and growth winners. We have shown that the quality of institutions determines whether countries avoid the resource curse or not. The combination of grabber friendly institutions and resource abundance leads to low growth. Producer friendly institutions, however, help countries to take full advantage of their natural resources (Mehlum, Moene, and Torvik 2006).” Arezki and van der Ploeg (2007) claim that countries where open and liberal policies are pursued can reduce the shock of the resource curse: “We do find that trade policies directed toward more openness can make the resource curse less severe and may even turn it into a blessing. ... our results are robust to the use of various indicators of institutional quality such as the risk of expropriation or the degree of corruption. If we use natural resource *abundance* rather than *dependence*, we also find evidence of a natural resource curse after controlling for geography, institutions, and openness. Furthermore, we find that this resource curse is attenuated if countries pursue more liberal trade policies.”

Moreover, van der Ploeg and Poelhekke (2008) put forward the argument that “The key to a turn-around for many resource-rich countries is financial development, ensuring openness and mitigating the effect of being landlocked, because the indirect negative effect of resource dependence on growth, via volatility, is much larger than any direct positive effect.” This is to say that a well developed financial system can also help to accomplish the identical result. Avendano et al. (2008) investigating the macro management of resource exporting countries in Africa and Latin America assert: “Commodity-exporting countries have realised clear benefits from the current boom. It has raised net export receipts and broadened exporters’ client bases, enabling them to retire costly debt, improve their credit profiles, increase foreign exchange reserves to reduce vulnerability to future speculative attacks, finance infrastructure for future growth and build nest eggs abroad and at home

for leaner times." However, it should be borne in mind that this was a result of a rather peculiar situation – the top of the boom prior to the beginning of the Great Depression Mark II, starting in autumn 2008.

Next we compile a classification of various policy measures available as a tools of the policy makers who wish to stop the potential pressure of a given resource impact turning into a "curse".

Industrial policy / diversification

In general an important issue related to economic diversification and restructuring of the economy is the extent to which it should be left to the free market; whereas, diversification may be an obvious solution it is proven to be an extremely elusive one to achieve. Since the early 1970s oil-exporting countries have given formal approval to the diversification of their economies away from dependence on crude oil exports. Despite this, the absolute record is very adverse with a vast amount of public funds being wasted on inefficient and uncompetitive industries (Stevens, 2003). This is at least partly due to the following two factors: i) as a result of the Dutch disease not only does the current traded resource sector experience severe contraction, but also the potential growth of new tradable sectors is excluded; and, ii) in most cases, the diversification strategy consists of government attempts to pick winners. However, it is accepted the governments may be ineffective in picking winners. This is not just because most selected companies are usually in the public sector, but because they do not face competition requirements. In addition, since they are government projects, it is likely that they will be subsidized and protected, which ultimately limits their development.

The only really effective diversification comes from private sector investment, although governments can play an important facilitating role in this process, a point made clear from the experience of the Asian tigers. This suggests that one of the solutions to the problem of diversification is to maximize the resource revenue flow to the private rather than the public sector. Of course this then raises the important issues of income distribution (efficiency versus equity) and private economic power leading to concentration of political power (stability versus social conflict). In this regard Di John (2011) makes an important contribution, suggesting the implementation of a dual-track growth-strategy as the most practicable transition policy. He notes: “In this context, the introduction of a dual-track growth strategy may be promising. The basic idea of this strategy is to promote an emerging dynamic sector (Track 1) where competition and risk taking are promoted while continuing to protect and subsidize a vast array of politically powerful but uncompetitive/inefficient producers in manufacturing and agriculture with the aim of reducing social tensions and maintaining political stability (Track 2). Examples of Track 1 strategies are export processing zones and industrial parks. Such a dual-track strategy postpones confrontation with established rent seekers while the dynamic sector drives competitive diversification of the economy and also builds a pro-reform political constituency. The main challenge of this strategy is to insulate or ring-fence the Track 1 sector from political and clientelist predation and capture. In general, this strategy can be seen as a transitional path to more growth-enhancing institutional reforms.”

Admittedly, as pointed out by Rodrik (2008): "The debate on industrial policy remains in an impoverished state -- still hung up on the question "should we or should we not? The way to move

forward is to understand that industrial policy is not that special: it is just another government task that can vary from routine to urgent depending on the nature of growth constraints a country faces. Once this point is grasped, it becomes easier to contemplate the institutional experimentation that its successful implementation will necessarily entail."

Investment

The investment policy implemented by the government of any resource-abundant country is destined to play a crucial role both in helping to avoid many of the macroeconomic pitfalls characteristic for such socio-economic systems and in encouraging the process of economic diversification by generating different sources of -- non-rent based -- value added sector of the economy. While in any particular case a specific, suitable solution needs to be found and implemented in a skilful way, serious considerations always should be taken first regarding the absorptive capacity of the economy, including available factors of production and their quality, existing infrastructure, and markets development. "Gradual scaling-up strikes a balance between promoting growth through investment and ensuring economic stability through a stabilization buffer. By scaling-up public investment slowly at first, this approach could allow a country with low capacity and limited buffers to shore up its stabilization fund and also mitigate any Dutch disease impact on traded goods production (Richmond et. al., 2013)."

The simple version of the Dutch Disease model, takes technology as predetermined; hence supplementary foreign exchange reserves are of no importance from the point of view of economic growth. Still, when a lagging behind developing country faces a technological gap, extra export

revenues, when channelled by a suitable industrial policy, can play an important part in accelerating the process of utilising advanced technology. If such a policy promotes 'learning', additional revenues can accelerate further the growth process. The government could promote industrialisation through protection, subsidies, financial incentives and investments in infrastructure.

Sterilisation policy and currency devaluation

There is general agreement that trying to stabilize spending to ensure steady and reasonable growth is an important part of proper macroeconomic management. Sterilisation is a policy tool that has been usually used for avoiding the expansionary effects of capital inflows and export revenue booms on the monetary base, and thus on the exchange rate and inflation.

One common factor in the case of those countries which have avoided the "curse" – Botswana, Chile, Indonesia and Malaysia – is that all four experienced significant depreciation of the real exchange rate as a result of explicit policy choices (Usui, 1997). In fact, the successful management of resource wealth in Botswana has been partly attributed to recurrent currency devaluation in order to maintain external competitiveness and offset, to the extent possible, the appreciation of its currency towards its main trading partner South Africa. However, if the devaluation is perceived as a necessary adjustment due to balance of payment difficulties, instead of as a strategic policy choice undertaken in the presence of a strong balance of payment position, it could affect the expectations of the economic agents in a negative way thereby triggering capital flight. Still, the effect of such a "[p]olicy action would be to prevent a significant appreciation of the real exchange rate. The central bank could require the export revenue windfall to be sold directly to the central bank, or the central

bank could purchase foreign exchange on the exchange market to prevent an increase in the nominal exchange value of the domestic currency (Mikesell, 1997)."

Sovereign Wealth Funds

Another possible intervention is through the mechanism of some form of Sovereign Wealth Fund. Many resource-rich countries have established special funds for depositing the revenues accrued from natural resources extraction. The potential usage of such funds includes: stabilising revenue streams by offsetting commodity price volatility; providing an intergenerational saving mechanism; avoiding Dutch disease effects by sterilizing the impact of foreign exchange inflows; and, ensuring transparency.

The positive role of such funds is not straightforward. In fact the causality may rather run the other way around -- a representative, prudent, and transparent government is likely to institute such a fund; however the establishment of a sovereign wealth fund is very unlikely to change the way an autocratic government works.

The (inconclusive) empirical evidence includes Devlin and Lewin, (2002) using a panel data for 71 countries, for the 1970 to 2000 period; they illustrate that the existence of wealth funds is correlated with reduced government spending and a higher share of investments. Another empirical study, comparing countries with and without wealth funds, implies that the interrelation between government expenditure and changes in non-resource exports is weaker in the group of countries having funds. Another finding is that the formation of a fund had no effect on spending by the government; Davis et al. (2001).

Wealth funds are no warranty for a proper fiscal stance and in reality cannot act as a replacement for sound fiscal and macroeconomic management. "The credibility and transparency of the fiscal policy framework can be supported by a well-designed resource fund, but the latter cannot be a substitute for an appropriate policy framework nor a panacea that obviates the need to strengthen overall fiscal management capacity. Funds need to be fully integrated with the budget and the fiscal framework (Baunsgaard, et al., 2012)."

Political Reforms

Why do some resource-rich countries continually follow wise policies while others don't? This question has to deal with the political economy of economic policy in resource-abundant countries. As briefly discussed above, the political dimension of the Dutch disease is what makes the therapeutic process such a complex task that can barely be achieved using only standard economic tools. The political aspect is the principal force behind economic policy making. One obvious solution is to develop democracy. However, as previously discussed, while this may well be highly advantageous for many reasons, it appears not to be a necessary condition for successful economic performance.

Another one is to remove corruption and contain rent seeking. It is in this context that new international initiatives on the management of resource wealth have emphasised transparency and responsibility of mineral revenues management. Most notably such initiatives include the IMF's *Guide on Resource Revenue Transparency*; the Open Society Initiative's (OSI) *Follow the Money: a Guide to Monitoring Budgets and Oil and Gas Revenue, OECD Anti-Corruption Network for*

Eastern Europe and Central Asia (ACN) and the British Government's initiative on *Extractive Industries Transparency Initiative (EITI).*

More practically, the legitimacy of government derives from its ability to deliver development simply defined as achieving better standards of living for the entire society. A greedy government by contrast lacks the linkages into the population or any other constraint that prevents the elite from plundering the economy. Securing an alignment of interests is crucial. The great danger is that "[r]ulers usually have had no concept of a wider national interest, beyond that of their immediate circle, and certainly no concept of economic growth as a legitimate social objective (Booth, 1995)." In contrast Indonesia succeeded as the government was "[a]ble to insulate themselves from pressures from powerful vested interests and pursue policies which have given top priority to the achievement of rapid rates of growth (Booth, 1995)"

Furthermore, attaining a better political structure and sustaining genuine economic growth and development, rather than being absorbed in rent-seeking activities, would benefit the oil exporting countries by possibly promoting trust and dependability among themselves. Such potential real cooperation between the oil-exporting countries would allow them not to fall victims to the prisoner's dilemma game's worst possible outcome.

In introducing the prisoner's – oil producer's -- dilemma we draw heavily on Bratvold and Koch (2011). One of the key basic and best known game theoretic approaches, where two players alone choose between two potential options and the reward for each participant depends on the decision made by both of them is the prisoner's dilemma. Here we cast the dynamics of the game as an oil

producer's dilemma by introducing two countries producing oil of the amount which each participant trusts will result in maximising their respective oil income. Assuming that the relevant countries supply a major proportion of the world's total production, thus determining the international price of oil, we move to illustrate the possible price and revenue outcomes.

Table 26: Oil production stability – a game theoretic approach

Potential outputs, prices and profits		Country B	
		10 barrels	20 barrels
Country A	10 barrels	USD 1,400	USD 1,500
		USD 1,400	USD 750
	20 barrels	USD 750	USD 800
		USD 1,500	USD 800

Source: Bratvold and Koch, 2011.

We assume that each of the two countries can choose to produce either 10 or 20 barrels of oil. If both countries agree to extract only 10 barrels each (and maintain the oil price high) both would be motivated to breach the contract by extracting 20 barrels. The judgment goes as follows: each country realizes that the other country can break their contract. Country A discern that if country B respects the contract and limits its production to 10 barrels, country A would gain USD 1,500 by extracting 20 barrels, i.e., 20 barrels x USD 75. If instead country A sticks to the agreement and restrict its production to 10 barrels, the upper limit of its earnings is USD 1,400 subject to country B respecting their contract. However, in case of country B breaking the deal, country A would get just USD 750 by acting in accordance with the agreement, while it would obtain USD 800 by breaking the agreement. The equivalent logic applies for country B.

Each country protects its own interest, and irrespective of what the other country chooses (to stick to the deal or to break it) the best option is to break the deal. This brings into “life” the dilemma. If the countries stick to the deal they would earn revenue of USD 1,400 and be at an advantage, rather than if both break the contract. The complexity is that neither one benefits from taking the risk, knowing that it is, at all times, in the other country’s interest not to follow the terms of the contract. Therefore, despite the mutual contract, neither of the countries can expect the other to respect its commitment (to extract no more than 10 barrels) without some supplementary contractual or enforcement process.

Chapter III: Excessive Debt or Excess Savings -- Fiscal and Monetary Policy Coordination in Transition Countries (CEE and CCA) -- Sovereign Bond Spread Assessment

Introduction

A range of academic studies have analysed the determinants of the difference between the sovereign's emerging market debt securities and US Treasury bonds and/or German bunds of similar maturities. Still, while there have been a number of papers dealing with yield spreads on Eurozone government bonds (e.g., Codogno, Favero and Missale (2003), Pagano and Von Thadden (2005), Mody (2009), and Klepsch (2011)) there have not been many methodical studies on the price determination of sovereign bonds (risk of default) in emerging markets; particularly in the group of Central and Eastern Europe (CEE) and Caucasus and Central Asia (CCA) countries. One early (partial exception) is the paper of Eichengreen and Mody (1998) examining launch spreads based on data for a mixed group of 55 emerging market countries over the period 1991 to 1996. They collect information on altogether 1,033 bonds split as follows: 670 from Latin America; 233 from East Asia; and 81 from Eastern Europe. Regressing spreads on various potential determinants they detect: "But the same explanatory variables have different effects in the principal debt issuing regions (Latin America, East Asia, and Eastern Europe)."

It is interesting to compare the coefficients of regression on the variables Debt/GNP and GDP growth between the combined group of Latin America and East Asia countries with the Eastern Europe bond issues. While for the former group the coefficient on Debt/GNP is relatively small, has positive sign (0.437) and is significant (t-stat 2.054), for Eastern Europe its value is big, negative (-1.255) and it is insignificant (t-stat -1.367). In the same vein the coefficient on GDP growth for

Latin America and East Asia is positive sizable (2.253) though insignificant (t-stat 0.616) and the equivalent coefficient for Eastern Europe is negative, vast (-14.250) and significant (t-stat -1.954). Furthermore, the coefficient of mutual determination corrected for degrees of freedom for the Latin America and East Asia estimated model is close to 0.6, while it is only about 0.09 for Eastern Europe. These OLS results suggest that about 60 per cent of the variation in spreads is explained for Latin America and East Asia and just about 9 per cent for Eastern Europe, anticipating the authors' statement: "And when it comes to changes in spreads over time, we find that these are explained mainly by shifts in market sentiment rather than by shifts in fundamentals."

McGuire and Schrijvers (2003), relying on data from August 1999 to June 2003, analyse the emerging market for debt at a higher stage of development. In their own words "The market for emerging market debt has matured considerably in recent years. Market liquidity and transparency have been enhanced as the investor base has broadened. In 1998, hedge funds accounted for 30% of all activity in this market, while high-grade or "real money" investors (e.g., pension funds and other institutional investors) constituted only 9%. By 2002, the share of hedge funds had declined to 10%, while that of high-grade investors had risen to 32%. Furthermore, an increasing number of countries are now able to issue longer maturity bonds (e.g., 10-year maturity), which is beneficial for issuers trying to reduce interest rate sensitivity, and for investors looking for higher-duration investment opportunities." Still, and despite the continued development and apparent integration of emerging markets into the international economic structures, their results "[s]uggests that the common variation in emerging market debt spreads is largely explained by changes in attitudes towards risk within the international investment community." Also they affirm "we find that a single common factor explains approximately 80% of the common variation."

Arezki and Bruckner (2010), use a dataset for 30 emerging market economies including five transition economies (Czech Republic, Hungary, Poland, Russia and Ukraine). They construct an individual international commodity price index per country that allows them to confine revenue windfalls from rising prices of exported commodities and in addition exploit two measures of political institutions. Their main findings are: i) "[p]ositive international commodity price shocks lead on average to a significant reduction in commodity exporting countries' spread on sovereign bonds."; ii) allowing for cross-country differences in political institutions entails that for democracies "[a] positive commodity price shock of size 1 standard deviation significantly reduced the spread on sovereign bonds by over 0.4 standard deviation. On the other hand [...] autocracies a shock of similar magnitude was associated with a significant increase in the spread on sovereign bonds by 0.3 standard deviations."; and, iii) "[i]n democracies [...] windfalls from international commodity price shocks were significantly positively associated with real per capita GDP growth, in autocracies they were associated with a significant decrease in real per capita GDP."

Belhochine and Dell'Erba (2013), applying spread regression to a panel of 26 emerging economies (including 7 transition economies: Bulgaria, Hungary, Kazakhstan, Poland, Russia, Serbia, and Ukraine) and bringing in the difference between the debt stabilising primary balance and the factual primary balance as a measure of debt sustainability, they find "[t]hat debt sustainability is a major determinant of spreads with an elasticity of about 25 basis points for each 1 percentage point departure of the primary balance from its debt stabilizing level." Furthermore they claim "[t]hat the sensitivity of spreads to debt sustainability doubles as public debt increases above 45 percent of GDP."

Overall the research papers have uncovered certain empirical regularities and plausible interconnections, but the established state of knowledge in this area is as yet by no means sufficient to resolve the question of what are the major determinants of sovereign bond spreads.

These common features include: lack of a domestic (or foreign) market for debt denominated in local currencies, moreover, such local home-currency denominated debt (if there may be one) for credibility reasons will be very short term; also, lack of sufficiently developed domestic institutions (e.g., pension funds) that would potentially demand such instruments.

In the field of fiscal policy and debt management -- as a constituent part of fiscal policy for any indebted country -- it is necessary to delineate the particular features of developing/transition economies and to specify the possible points of inconsistency between the implementation of fiscal policy and the achievement of debt management objectives. The government should know the sources of potential divergence in order to undertake measures to maintain a stance of fiscal policy which is conducive to successful debt management operations.

There are a number of differences between developed and developing countries, which create diverse conditions for fiscal policy and debt management implementation. These differences are due to two of the most important characteristics of a developing economy – the low income level and the fragile confidence in policy commitments and their implementation. Hence, a conclusion might be drawn that a developing country is more prone to maintain fiscal deficits and opt for debt-financing (external) in order to alleviate current social problems and to improve economic growth. However, the outcome might be a high level of indebtedness and a heavy burden of debt service, which tends to extract a constantly growing amount of domestic resources.

Careful considerations of the patterns of fiscal policy in a developing economy and their relation to debt dynamics seem to reveal an asymmetry in Government's preferences – its unwillingness / inability to raise taxes and readiness to satisfy an expanding range of social needs. Due to this asymmetry a promise of an indebted developing country's Government to balance the budget in order to guarantee future debt payments may be taken as lacking credibility. The lack of confidence is embedded in the risk premium on government debt required by the investors. A growing risk premium may provoke an acceleration of debt accumulation.

It is important to try to explain the interrelation between fiscal policy measures and the effectiveness of debt management. Emerging economies are more predisposed to debt financing due to weaknesses of their institutions, the high share of poverty and weakness of the private sector. An indebted country should build up the capacity for effective debt management, but, prior to getting involved in any debt operations, it should assess the investors' perceptions.

Identifying the potential answers to the subsequent questions is of paramount importance: i) What are the dynamics of the government debt – rising, stable or declining?; ii) What are the dynamics of the risk premium on debt – rising, stable or declining?; iii) What are the dynamics of the primary balance?; iv) How has fiscal policy influenced the debt and risk premium dynamics in the past? v) Is economic growth – high/low?, rising/falling?, steady/volatile?

If the answers to the above questions reveal that the government is still in a phase of debt accumulation it should know that even if it tightens the fiscal stance and makes the necessary adjustments the debt may continue growing, though at a decelerating rate. After a certain period of time the debt-to-GDP ratio may stabilize and only after that the risk premium may start to decline. If the government is on the threshold of entering another phase of debt accumulation it has to

undertake severe adjustments in its fiscal policy in order to prevent the default on debt. Again long after the debt-to-GDP ratio stabilizes, the risk on government debt may remain high. Reducing the risk premium implies very tight fiscal policy for a long time.

However, even if eventually the country reaches the stage of a low debt environment – there are reasons why -- it is useful to still have developed a sovereign debt market. This subject was discussed, rather extensively, some years ago when budget surpluses used to be projected for a number of countries.

The reasons for having the government debt market include: i) sovereign debt plays the role of the risk-free asset; ii) government debt is seen as a safe haven instrument; iii) provides a yield curve to the markets; iv) foreign investors might not want to invest if there is no government market debt; v) the Central Bank can provide liquidity to the market through open market operations; and, vi) it contributes to the wider development of financial markets,

Literature review

The empirical research on the determinants of government bonds spreads in advanced economies is vast, whilst the existence of similar analytical papers dealing with the emerging markets economies is more restricted. Still, both have recently enlarged, in particular since the beginning of the -- financial and economic -- crisis from 2008.

The main focus is: macroeconomic fundamentals determining sovereign risk; external shocks related to global liquidity; risk aversion / appetite; state of development of domestic financial markets; and, quality of governance indicators.

Contributions about the influence of macroeconomic variables on sovereign spreads, include Min (1998[42]), Eichengreen and Mody (1998), Kamin and von Kleist (1999), and Hilscher and Nosbusch (2010). In general, these studies find considerable association with macroeconomic fundamentals and evidence that sovereign spreads in the 1990s declined more than country fundamentals' changes could account for. Baek et al (2005), among others, offer a possible explanation: they "[p]ostulate that the market-assessed country risk premium is determined not only by economic fundamentals of a sovereign but also by non-country-specific factors, especially the market's attitude towards risk." In their analysis they propose an indicator by which to quantify investor's appetite towards risk -- Risk Appetite Index (RAI). Using quarterly data over the period 1992 to 1997 for five countries (Argentina, Brazil, Mexico, Philippines, and Venezuela) and choosing as dependent variable the Brady bond stripped yield spread (BBY), they conclude: "BBY is the most sensitive to changes in RAI, in comparison to changes in the other economic variables. A one standard deviation change in RAI changes the bond yield spread by 0.208 standard deviations, which far outweighs the effect of comparable changes in liquidity, solvency or economic stability variables. This demonstrates that quarterly yield spreads, while responding to changes in economic fundamentals, are driven largely by changes in the market's attitude towards risk." Similarly, utilising principal component analysis, McGuire and Schrijvers (2003) recognize a single universal factor interconnected to investors' risk sensitivity that explains about eighty per cent of the common spread variations. This finding is supported by the conclusion of Jaramillo and Weber (2013) that

[42] "This study identifies several groups of important explanatory variables for the cross country differences in bond spreads. First of all, liquidity and solvency variables are found to be significant for the yield spread determination. Specifically, these are debt-to-GDP ratio, the international reserves-to-GDP-ratio, the debt service ratio and export and import growth rates. Second, some of the macroeconomic fundamentals are found to be significant for the bond spread determination. These include the domestic inflation rate, net foreign assets as measured by the cumulative current account, the terms of trade and real exchange rate."

"[d]omestic bond yields in emerging economies are heavily influenced by two international factors: global risk appetite and global liquidity." Other studies, such as Arora and Cerisola (2001), Ferrucci (2003), and Baldacci and Kumar (2010) while confirming the influence of macroeconomic fundamentals, focus rather on the important effect of global financial markets spillovers on sovereign spreads.

Discussing the outcomes of their model, Arora and Cerisola (2001) record that "Specifically, in the cases of Argentina, Brazil, Bulgaria, Mexico, the Philippines, and Poland, the model fails to fully account for the sharp narrowing of spreads that took place during the period leading up to the Asian crisis. The narrowing of sovereign spreads between the first half of 1996 and mid-1997 was particularly pronounced in these countries, and may have been associated more with changes in market access and with global portfolio shifts by institutional investors than with country-specific fundamentals. These results seem to suggest that some form of "contagion" may have also contributed to narrowing rather than widening sovereign spreads for a group of developing countries during this period."

Kashiwase and Kodres (2005), Hartelius, Kashiwase and Kodres (2008), and Gonzalez-Rozada and Levy-Yeyati (2008) find that macroeconomic fundamentals, global market liquidity and risk sensitivity mutually comprise the key causes of sovereign spread changes.

Similar conclusions are established by Favero, Pagano and Von Thadden (2008), who analysed the sovereign spreads of European Union countries. Mody (2009) examines the interrelations linking sovereign bond spreads in the euro area countries and financial exposure and finds that financial exposure (calculated as a ratio of an equity index for the relevant country's financial sector to the equity index taken as a whole) is strongly correlated with spread changes.

Caceres et al. (2010) – inspect the stages through which the swap spreads of the EU countries have passed and the driving forces behind these movements. They trace four distinctive periods:

"(i) [f]inancial crisis build-up, between July 2007 and September 2008. [...] In general, fundamentals were supportive of sovereign bonds, as both the deficit and the debt were still improving at this stage; (ii) [s]ystemic outbreak, between October 2008 and March 2009, as sovereigns stepped in and supported financial institutions, government bond yields rose relative to swap yields across the board, on contagion from countries more directly involved in the financial crisis and fundamentals, which had started deteriorating; (iii) [s]ystemic response phase, between April 2009 and September 2009, all government bond yields fell back towards swaps, as lower probability of distress in some countries was favourably affecting others; (iv) [t]he sovereign risk phase, since October 2009, swap spreads have started to be driven by country-specific developments. They have been broadly unchanged for most countries, but tightening substantially for Greece and Portugal where bond yields have surged well above swap yields on further weakening in fundamentals and intense risk of contagion." They conclude "[t]hat earlier in the crisis, the surge in global risk aversion was a significant factor influencing sovereign spreads, while recently country-specific factors have started playing a more important role."

Dell'Erba and Sola (2011) – estimate the effect of the monetary and fiscal policy stance on both long-term interest rates and sovereign spreads by constructing a semi-annual dataset of macroeconomic and fiscal forecasts for 17 OECD countries over the period 1989-2009. They find "[t]hat in general two unobserved factors can explain more than 60% of the variance in the data, both for bond yields and for sovereign spreads. We identified these factors to be the aggregate monetary policy and the aggregate fiscal policy stances. In addition, sovereign spreads depend also

on global risk aversion, which accounts for about 12% of the panel variance." Furthermore, they "[f]ind that global supply of funds, represented by global monetary and fiscal policy stances plays a relevant role in affecting long-term interest rates. The effects of the global fiscal stance are by far quantitatively more important than domestic fiscal policy alone, and are significantly heterogeneous across countries."

Kaminsky, Reinhart and Vegh (2005) consider and closely examine the important question of procyclical versus countercyclical capital flows and monetary and fiscal policies depending on the country's level of economic development. They use a sample of 104 countries for the period 1960-2004. Their major findings are:

"1. Net capital inflows are procyclical in most OECD and developing countries.

2. Fiscal policy is procyclical for most developing countries and markedly so in middle-high income countries.

3. Though highly preliminary, we find some evidence of monetary policy procyclicality in developing countries, particularly for the middle-high-income countries. There is also some evidence of countercyclical monetary policy for the OECD countries.

4. For developing countries -- and particularly for middle-high-income countries -- the capital flow cycle and the macroeconomic cycle reinforce each other (the when-it-rains-it-pours syndrome).

Taken from a policy view point, the implications of our findings appear to be of great practical importance. While macroeconomic policies in OECD countries seem to be aimed mostly at stabilizing the business cycle (or, at the very least, remaining neutral), macroeconomic policies in

developing countries seem mostly to reinforce the business cycle, turning sunny days into scorching infernos and rainy days into torrential downpours."

What's more, fiscal policies are incorporated as powerful forces of sovereign spread determination in European Union countries by Bernoth, Von Hagen and Schuknecht (2004); Afonso and Strauch (2004); and, Hallerberg and Wolff (2006). Hallerberg and Wolff (2006) after controlling for institutional changes, conclude that fiscal policy remains a significant determinant of the risk premium. According to them superior institutions are coupled with a lower risk premium. Moreover deficits and surpluses matter less for the risk premium in countries with better institutions. Apparently this reflects the market view that proper institutions will be able to deal with fiscal problems and make the monitoring of annual developments less important. The results are robust to controlling for country fixed effects and different estimation methodologies.

Maltriz (2012), embark upon the subject-matter with Bayesian Model Averaging (BMA)[43]. In his study the author applies BMA "[t]o identify the best models and assess the quality of potential regressors." They "[c]onfirm some important findings of the literature, doubt others and provide mixed evidence to a third group of variables." They [f]ind that the most important drivers of default risk in the Eurozone are government debt to GDP, budget balance to GDP and terms of trade. For economic growth, export growth, import growth and the US interest rate the likelihood is between 10 and 50%, whereas for some variables found to be significant in the literature, as interest rate costs, capital formation and inflation, this likelihood is below 10%." Furthermore, he maintains: "Our results indicate that the key variables, budget balance (deficit) to GDP and the debt to GDP,

[43] Bayesian model averaging (BMA) offers a coherent systematic mechanism for accounting for model specification uncertainty and inspection of the robustness of results to alternative model specifications.

that are included in the Maastricht treaty, in fact, are the most important risk drivers of default risk, whereas other, maybe more long-term oriented, variables like capital formation and economic growth and also inflation could not prove to be important. Thus, avoiding defaults – and maybe even the surviving of the EMU – crucially depends on the successful budget consolidation of the member states and the reduction of debt to GDP. The success seems to be partly influenced by favourable conditions in the external sector, in particular, by favourable terms of trade, which seems to be more important than the financing conditions and interest rate costs."

Gibson, Hall, and Tavlas (2011), concentrating on a single country – Greece – and macroeconomic variables shaping spreads, "[a]rgue that during the period 2001-2009 the Greek economy was marked by growing, unsustainable fiscal and external imbalances. [...] the sharp reduction in interest-rate spreads that occurred during much of this period did not adequately reflect these imbalances. [...] empirical results provide some evidence for this view. [...] also provide evidence that the sharp, upward reversal of spreads following the outbreak of the Greek financial crisis also did not fully reflect fundamental factors. Thus, both undershooting and overshooting of spreads have occurred."

This analysis is confirmed and extended additionally in space and time, and causality by De Grauwe and Ji (2012) who "[f]ind evidence that a significant part of the surge in the spreads of the PIGS countries (Portugal, Ireland, Greece and Spain) in the eurozone during 2010-11 was disconnected from underlying increases in the debt-to-GDP ratios and fiscal space variables, but rather was the result of negative self-fulfilling market sentiments that became very strong starting at the end of 2010."

De Grauwe and Ji assert that the account of spreads widening "[i]s also a story of self-fulfilling debt crises, which in turn lead to multiple equilibria." They suppose that given the state of affairs: liquidity crisis, imposed austerity measures (presumably leading the country to recession), plus high interest rates on government securities could result in a solvency crisis. According to their model investors try to factor in the costs and benefits to the government from defaulting. "A major insight of the model is that the benefit of a default depends on whether this default is expected or not." If investors expect a default, a default would occur, if they do not, no such would take place. Furthermore, they consider that if a country is not a member of the Eurozone, "This makes it possible for the country to always avoid outright default because the central bank can be forced to provide all the liquidity that is necessary to avoid such an outcome."

While this argument may add up within its settings, one should not forget that investors may lose their confidence in the ability of the government of the "stand-alone country" to sustain its currency and take flight to safety by promptly exchanging the domestic currency denominated debt for cash – Euro or/and USD. Thus the self-fulfilling prophecy (or speculative crisis) may well become true – the country would rapidly lose foreign reserves; in time it would have no choice but to devaluate its currency; the level of the external debt would increase in local currency units; this would lead eventually to monetisation of the debt; this state of affairs brings forth new speculative attacks. Hence, just being a "stand-alone country" is not likely to be sufficient to insulate you from self-fulfilling expectations or speculative attacks.

Focusing on emerging economies, the analysis performed by Akitoby and Stratmann (2006) emphasises the importance of sustainable fiscal policy and high fiscal adjustment, where reduction in current expenditures proves to be more effective on spread reduction than tax increases. The shaping power of liberalisation of the capital account, the currency convertibility risk premium, and the rule of law are investigated by Bacha, Holland and Gongalves (2008) as determinants of the local interest rates of emerging economies. Whereas, Edwards (2005), by means of the bidirectional interrelation between interest rates and capital account liberalisation shows that the degree of convergence of domestic and international interest rates could be used to assess the real degree of openness of the capital account.

A connected subject matter that has received considerable attention is the relationship between sovereign spreads and default risk. Favero and Missale (2011) "[f]ind that default risk is the main driver of yield spreads, suggesting small gains from greater liquidity. Fiscal fundamentals matter in the pricing of default risk but only as they interact with other countries' yield spreads; that is, with the global risk that the market perceives. More importantly, the impact of this global risk variable is not constant over time, a clear sign of contagion driven by shifts in market."

Hischer and Nosbusch (2010), using a sample of 31 emerging market countries and based on daily data for the period 1998-2007 investigate spread determinants and "[p]ay special attention to the volatility of fundamentals." They "[f]ind that the volatility of the terms of trade is both statistically and economically significant in explaining spread variation. A one standard deviation increase in the volatility of terms of trade is associated with an increase of 164 basis points in spreads, which

corresponds to around half of the standard deviation of observed spreads." The authors assert as well that the terms of trade volatility is a significant predictor of country default. However, an important restriction of their conclusions is the regional and economic divergence of the countries included in their sample (Latin America 12, Africa 5, Eastern Europe 6, and Middle East and Asia 9) for which (time-invariant factors) no controls are provided.

Another important area of research is the detection of short-term and long-term factors determining the sovereign bond spreads. Bellas, D., M. Papaioannou, and I. Petrova (2010) results indicate that in the long run, fundamentals are considerable determinants of emerging market sovereign bond spreads, while in the short run, financial volatility is rather the substantial determinant of spreads than the fundamentals aggregates. Furthermore, researchers have also distinguished between the determinants of sovereign bond spreads during normal and crisis periods. Ebner (2009) highlights a noteworthy distinction in government bond spreads in Central and Eastern Europe throughout crisis and non-crisis periods. He provides evidence that market volatility, political instability and global causes gain in importance and predominantly explain the increase in spreads during crisis periods, while macroeconomic aggregates become less important.

In addition, another approach in the literature deals with the interrelations between debt levels and their impact on economic growth (trough implicit transmission mechanisms) within the framework of a threshold model, where the behaviour of the variables is expected to change distinctly, when certain – threshold – levels are reached. The most influential paper in this respect has been (until very recently) the one published by Reinhart and Rogoff in 2010 (*Growth in a Time of Debt*). There the authors claim to have identified a key stylized fact: a burden of public debt larger than ninety percent of GDP notably and consistently reduces GDP growth. Examining public debt and GDP

growth among twenty advanced economies in the period after the second world war, they determine that the average real GDP growth rate for countries having a public-debt-to-GDP ratio of over ninety per cent is, in fact, negative, amounting to -0.1 per cent.

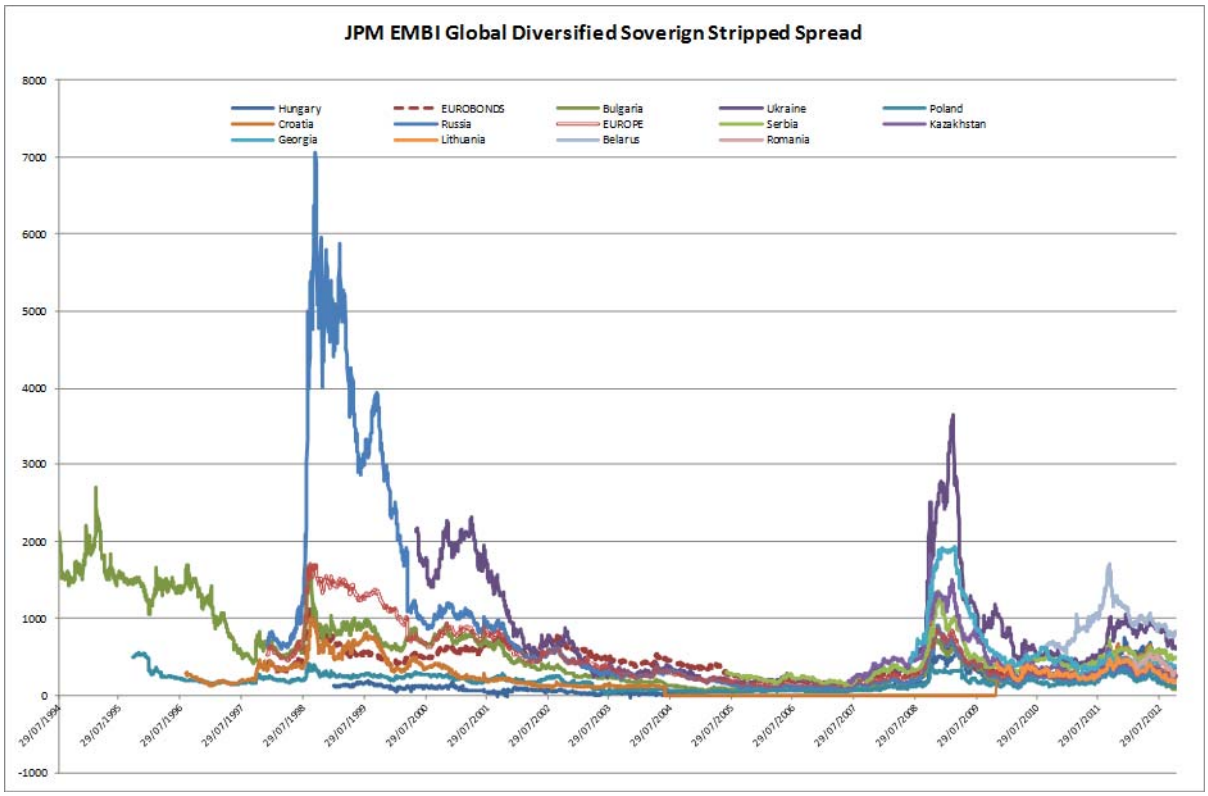
However, Herndon Th., M. Ash and R. Pollin (2013) have replicated Reinhart and Rogoff (2010) and were able to establish that coding errors, biased exclusion of available data, and unconventional weighting of summary statistics have led to miscalculations that provide a misleading picture of the relationship between public debt and GDP growth. They reveal that when accurately calculated, the annual average real GDP growth for national economies with a public-debt-to-GDP ratio of over ninety per cent is actually 2.2 percent, not -0.1 percent as stated in Reinhart and Rogoff. That is to say, that average GDP growth, when public debt/GDP ratios are in excess of ninety per cent is not significantly different from the average GDP growth when debt/GDP ratios are lower.

Emerging Markets Bond Indices

Figure 44 (below) depicts the developments in sovereign stripped spreads for selected CEE and Caucasus and Central Asia (CCA) countries over the period of 1994 to 2012. Over the period starting from the end of 2005 to around the first quarter of 2007, sovereign spreads clustered closely together, reaching their historically lowest point of below 200 basis points. Given that, undoubtedly, there were significant differences in the creditworthiness of the borrowers in the index -- this state of affairs at that time might suggest that investors did not differentiate adequately among borrowers. This situation was followed eventually by the Bear Sterns alarm in March 2008, which led to the increased discrimination in spreads across countries. Furthermore, the spreads widened extensively after September 2008, following the bankruptcy of the Lehman Brothers.

Hence, the key question is: was the narrowing of the spreads and their compression a result of an improvement of CEECCA country sovereigns' macroeconomic policy, implemented after 2002, or was it due to global excess liquidity provision? If better domestic macroeconomic policy efforts and solid reforms implemented in this period have led to: i) improvement in sovereign debt management e.g., by increasing the average debt portfolio duration and reducing the stock of FOREX debt; ii) development of domestic financial markets with enlargement of the investor's base and enhancement of the risk management techniques; iii) continuing financial liberalization; iv) sustainable fiscal adjustment, reserve accumulation and price stability; and v) adoption of the institutional structure most conductive to prosperity, then it would be expected that any tighter monetary policy environment in the developed economies should only have a tiny effect on spreads.

Figure 44: The Emerging Markets Bond Indices (EMBI) Sovereign Stripped Spread, Daily



Credit default swaps (CDS)

Credit default swaps are normally used as a measure of risk assessments on government debt. The spreads in Figure 46 are for five-year contracts on CDSs with the spreads measured in basis points -- each basis point is equal to USD 1,000. Seemingly comparable to an insurance contract, buyers of a CDS pay for insurance against a credit event on the underlying sovereign debt. For the Ukraine five-year CDS, the insurance premium is the annual insurance payment relative to the amount of debt. For example in March 2009, these CDSs reached a spread of more than 3,800 basis points (with even more extreme values on a daily basis, as can be seen at chart 3, below), meaning that the buyer pays an insurance premium of about 38 percent per year of the value of the securities (i.e., USD 3,800,000 on $10,000,000 worth of debt). The credit default swap seller collects the premiums and pays out if a credit event occurs. A credit event takes place when there is a substantial, identifiable loss. Credit events applicable to governments are failure to pay on the debt or restructuring of the debt. Generally speaking, a restructuring involves reduced payments or payments that are extended over time with no compensation. The occurrence of a credit event gives the insured the right to deliver certain government securities to the seller; and the seller of the insurance has the obligation to pay the face value of the debt, instead of the lower market value, to the buyer.

These CDS spreads can be interpreted as a measure of the perceived risk that a government will restructure or default on its debt. CDS spreads in April 2012 imply that the perceived probability of the Ukraine government defaulting is substantially higher than it was one year earlier, but lower than in 2009.

Figure 45: Emerging Markets Credit Default Swaps, Monthly

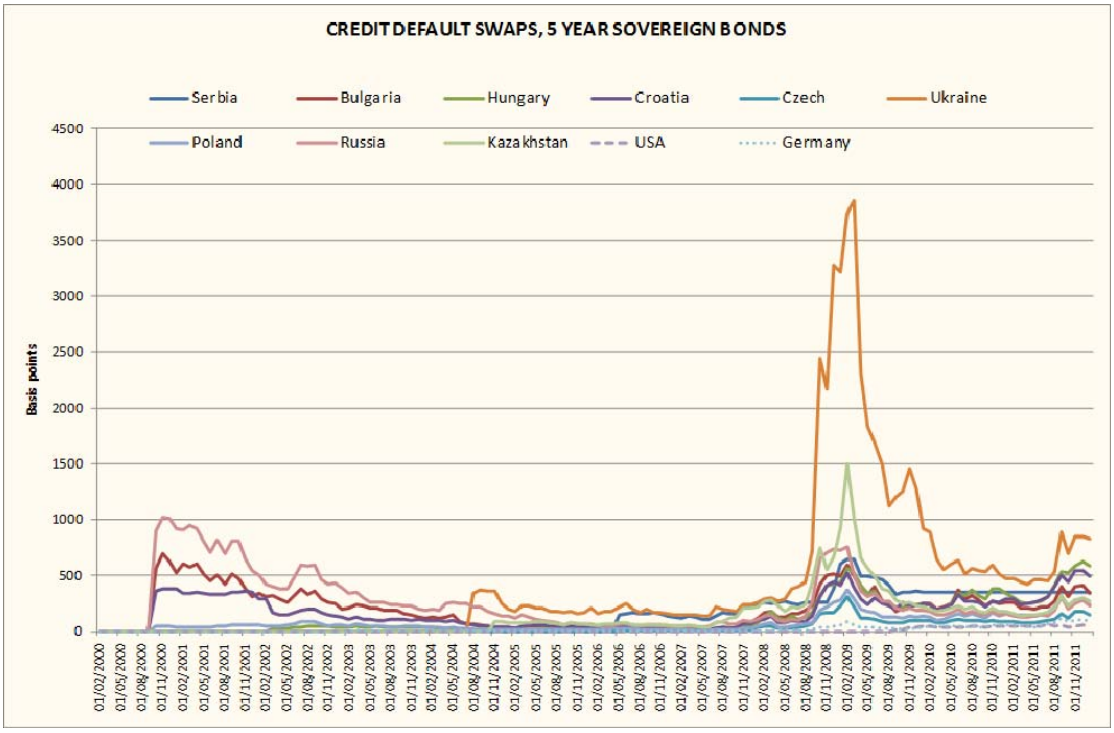
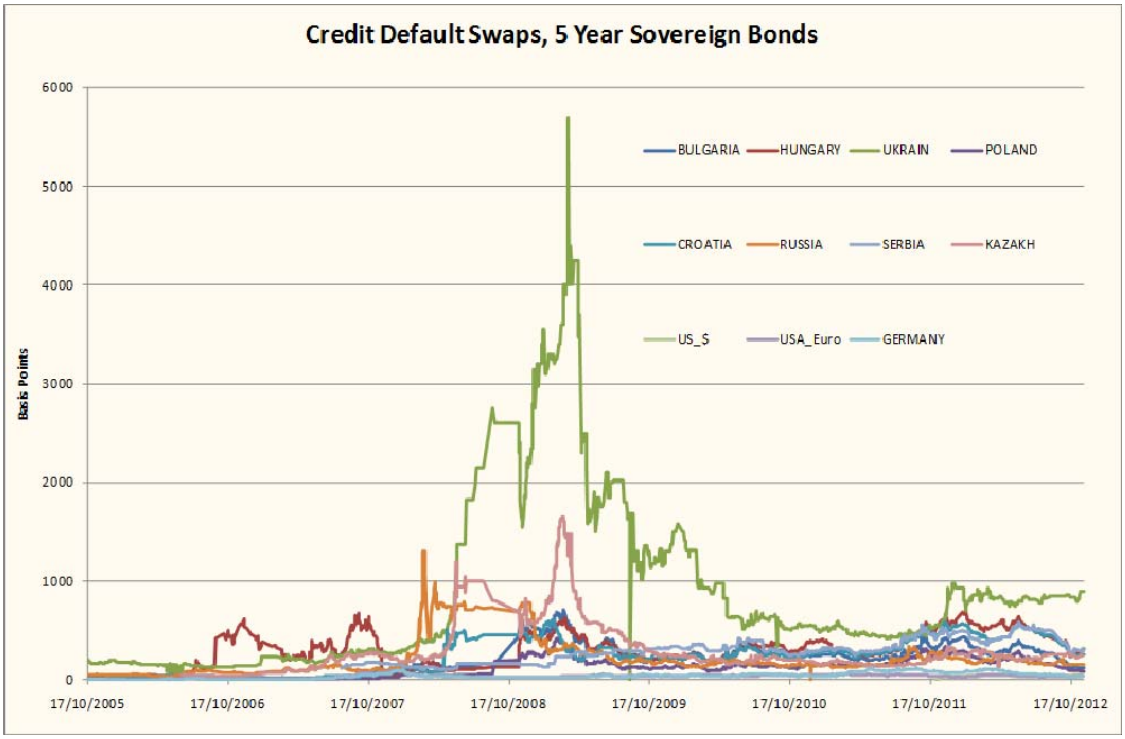


Figure 46: Emerging Markets Credit Default Swaps, Daily



Figures 45 and 46 (above) show the levels of spreads on credit default swaps (CDSs) for selected CEECCA sovereign debt (the spread is the premium that a buyer pays for the CDS). These charts contain two industrialized countries (with low spreads), USA and Germany for comparison purposes. Three countries stand out with higher spreads at present (Nov 2012): Ukraine, Hungary, and Serbia (all above 300bp). These countries have extensive economic problems and hence, profiles of government deficits, characterised with poor prospective for achieving sustainable budget position.

It is important to note that "Credit default swaps (CDS) continue to be controversial, with concern that trades in them could drive prices of government debt down. A major concern recently has been whether CDS spreads on government debt reflect assessement of the probability of restructuring or default or instead represent "speculative attacks" with little or no basis in the governments' situation (Dwyer and Flavin, 2010)." Hence, do CDSs mirror risk or they are driven by other forces?

In May 2010 the German Federal Financial Supervisory Authority (BaFin) put into operation a complete ban on taking naked sovereign CDS positions.[44] On March 14, 2012, the European Commission adopted a proposal for regulating short selling and certain aspects of credit default swaps, *de facto* permitting the use of CDS only for the purpose of hedging long positions already held by investors.[45] As the Commission points out, there are resemblances between short selling

[44] General Decree of the Federal Financial Supervisory Authority (BaFin) on the prohibition of naked short-selling transactions in debt securities of Member States of the EU whose legal currency is the euro of 18 May 2010 (revoked with effect from 27 July 2010)

[45](14) Buying credit default swaps without having a long position in underlying sovereign debt or any assets, portfolio of assets, financial obligations or financial contracts the value of which is correlated to the value of the sovereign debt, can be, economically speaking, equivalent to taking a short position on the underlying debt instrument. The calculation of a net short position in relation to sovereign debt should therefore include credit default swaps relating to an obligation of a sovereign debt issuer. The credit default swap position should be taken into account both for the purposes of determining whether a natural or legal person has a significant net short position relating to sovereign debt that needs to be notified to a competent authority and where a

stocks that one does not own and buying CDSs on assets that one does not have. These positions are such that speculators profit from adverse developments in the underlying security, and the positions could contribute to a decline in prices in the underlying assets, e.g., prices of government debt.

Economic theory is yet to provide an unambiguous answer to the long standing question about whether speculation in general and in derivative markets in particular is proving predominantly stabilizing or rather destabilizing to any given economic system. For example Portes (2010) concludes: "Banning naked CDS will require common action in the US and in the EU, but the political environment is right. We should not lose this opportunity."At the same time, Duffie (2010) argues that "Regulations that severely restrict speculation in credit default swap markets could have the unintended consequences of reducing market liquidity, which raises trading execution costs for investors who are not speculating, and lowering the quality of information provided by credit default swap rates regarding the credit qualities of bond issuers. Regulations that severely restrict speculation in credit default swap markets could, as a result, increase sovereign borrowing costs somewhat."

More obviously sovereign CDS spreads can have a potentially important functional role in the process of price discovery. Still, empirical results concerning who leads the price discovery – the sovereign CDS market or the government bond market are mixed and imprecise. These divergences may be partly related to the different time periods, sampling frequency, methodology and a choice of data. What conclusions have the empirical studies revealed:

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competent authority suspends restrictions on uncovered credit default swap transactions for the purposes of determining the significant uncovered position in a credit default swap relating to a sovereign debt issuer that needs to be notified to the competent authority.

REGULATION (EU) No 236/2012 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 14 March 2012 on short selling and certain aspects of credit default swaps

A number of papers provide support for the dominance of the government bond market, while others claim to have verified the primacy of CDS market. Gyntelberg et. al. (2013) utilising a vector error correction model for France, Germany, Greece, Ireland, Italy, Portugal and Spain over the period October 2008 to May 2011 and using intraday (30 minutes) price data find "[t]hat for most countries the CDS market leads the bond market in terms of credit risk price discovery. In other words, CDS prices tend to move first in response to news, and bond prices tend to adjust towards the pricing in the CDS market. Hence, credit spreads in the two markets tend to converge over time as suggested by theory. […] [d]eviations do not persist for long. The estimated half lives of a shock to the basis range from around half a day to 12 days across the countries […]." Palladini and Portes (2011) using data for six EU countries (Austria, Belgium, Greece, Ireland, Italy, and Portugal) covering the time span of 30 January 2004 to 11 March 2011 find that CDS market spreads in general lead bond markets; they find that the adjustment towards equilibrium is sluggish. Fontana and Scheicher (2010) examine ten euro sovereigns (January 2006 – June 2010) and find that price discovery is uniformly divided between CDS and bond markets. O'Kane (2012) presents comparable results; by means of Granger-Causality tests on a daily data for six industrialized countries covering the period of January 2008 to September 2011; he concludes that for France and Italy the bond markets lead the process of price discovery; for Spain and Greece, CDS markets Granger cause the bond market changes, whereas for Ireland and Portugal, causality is running both ways. The author acknowledges that"[w]hile a negative test would rule out the hypothesis of true causality, a positive test tells us that we cannot currently reject such a hypothesis."

Aktug et al. (2012) study thirty emerging markets from January 2001 to November 2007 using monthly sampling frequency. They point up that bond markets lead CDS markets largely, but not

always. Support for the bond markets leading role is also found in Ammer and Cai (2011). They analyse nine emerging economies for the period February 2001 to March 2005, finding a long-term relationship between CDS and bond markets for the majority of countries. Overall tentatively they conclude that the bond market leads the CDS market more often. Giannikos et al. (2013) inspect the links of price discovery via, daily CDS spreads; bond spreads and stock prices over the period 2005-2008 for ten US financial firms. They find that throughout the sample period, CDS and bond spreads are evidently cointegrated -- the CDS market dominating in price discovery. Examining 18 industrial and emerging economies from January 2007 to March 2010, Coudert and Gex (2013) conclude that bonds appear to lead for "low-yield countries" (developed) European economies, while the derivative market tend to be the direction-finder for "high-yield" emerging economies.

Thus the evidence on price discovery presented above is, at any rate, adequate to challenge the conviction that the relatively small CDS market cannot influence bond spreads in sovereign debt markets as its net exposure is just a few per cent of the total government bond stock. Typically the proponents' justification of this view may go like this: "Profitable manipulation through price impact is difficult. Putting aside the difficulty of profiting from manipulation, achieving a sizable price impact would require CDS manipulators to take positions that are large relative to the amount of debt outstanding. In the case of the financially weaker Eurozone sovereigns, Portugal, Spain, Ireland, Italy and Greece, the aggregate net CDS positions […] represent small fractions of their respective amounts of debt outstanding. With Greece, for example, the aggregate of the net CDS positions held in the entire market has remained well under 3% of the total amount of Greek debt outstanding. […] That is, even if all CDS protection buyers in the market were manipulators, and had conspired to drive up CDS rates, they would have had only a marginal impact on the total

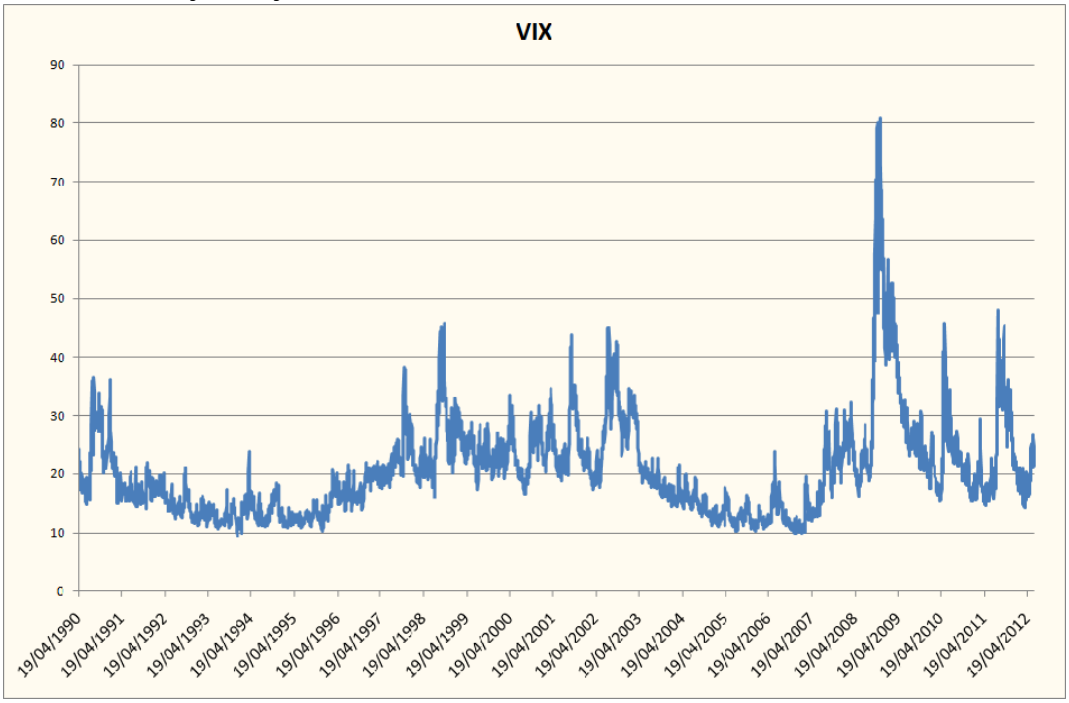
amount of sovereign credit risk borne by bond owners and sellers of protection. Supply and demand for the sovereign's credit would cross at a new price that is relatively close to the “fair-market” (unmanipulated) price (Duffie, 2010).”

A crisp competent answer – with which we completely concur -- is provided by Portes (2010), “We are told [...] that because net CDS exposures are only a few percent of the stock of outstanding government bonds, ‘the tail can’t wag the dog’, so the CDS market can’t be responsible for the rising spreads on the bonds. This of course contradicts the argument that the CDS market leads in price discovery because of its superior liquidity. More important, it is nonsense. Over a period of several days in September 1992, George Soros bet around $ 10 billion against sterling, and most observers believe that significantly affected the market – and the outcome. But *daily* foreign exchange trading in sterling then before serious speculation began was somewhat over $100 billion. The issue is how CDS prices affect market sentiment, whether they serve as a coordinating device for speculation.” Furthermore, strong empirical support is provided from Shim and Zhu (2010). The authors analyse the time period of January 2003 to June 2009, covering (de facto) seven Asian economies (Hong Kong, India, Japan, Korea, Malaysia, the Philippines, and Singapore) and using data amalgamated at three levels -- bond, company, and country level. Among other things they conclude: “[t]hat at the peak of the financial crisis the CDS market contributed to higher spreads in the bond market. Given that the CDS market played the role of shock amplifier during the crisis, it is important to make sure that policymakers introduce measures to mitigate the negative spillover effect from the CDS market to the bond market.”

Chicago Board Options Exchange Volatility Index (VIX) -- Global Risk Aversion Proxy

VIX, was first initiated by the CBOE in 1993 (data series commencing in January 1986), as a weighted measure of the implicit volatility of eight S&P 100 at-the-money options (both put and call). In ten years time, it has been extended to exploit options based on the broader index (S&P 500), offering more precise scrutiny of investors' expectations on future market volatility. Thus VIX is a commonly used measure of market risk and is often referred to as the "investor fear gauge". VIX values bigger than 30 are normally associated with a large amount of volatility due to investor's fear or insecurity, whereas values under 20 in general correspond to tranquil periods in the markets. When VIX reaches excessively high levels, this tends to imply that economic agents have bought puts as insurance against a falling market (the explanation is following on *Investopedia.com*, "VIX - CBOE volatility Index").

Figure 47: Chicago Board Options Exchange Volatility Index (VIX) – Global Risk Aversion Proxy, daily



We believe that VIX is an appropriate index to use in our analysis as: I) it is widely accepted to represent investor's expectations of future market volatility of S&P 500; ii) it has high frequency, long period time-series; and iii) it adequately represents the directions of investors' sentiments.

The higher is the interest rate on debt, determined to a great extent by the risk premium, the higher will be the speed of debt accumulation. Under the conditions of low incomes, a low savings rate and underdeveloped capital markets, and particularly when the government borrowing requirements are high, the domestic commercial banks might become the single buyer of government debt. Given the settings of open movement of capital, the distinction between domestic and external debt becomes irrelevant and domestic commercial banks set their interest rates on government debt based on risk – rate of return considerations and arbitraging between domestic and foreign assets

Securities issued by an emerging market's government compared to other domestic financial assets have the property of a relatively low risk and low cost of acquisition asset. However, compared to developed countries' government debt, they are risky assets. The size of the risk premium implicit in the required interest rates on developing country's government debt depends on the credibility of the economic policy commitments and the probability of them being implemented.

The speed of debt accumulation may be assessed as moderate if the risk premium remains stable and relatively low. It may be interpreted also in terms of expectations of future fiscal policy – expectations that the government may easily adjust the primary balance and it may keep control over the debt accumulation process maintain the risk premium at a relatively low and stable level.

If investors perceive that the indebted government follows an unsustainable fiscal policy they may indicate their concerns by shortening the accepted maturity of government debt and raising the risk premium. Debt management operations under the conditions of fast debt growth – measured by the proximity to the sustainable level -- will be inefficient and will increase the future costs of debt service. The high speed of debt accumulation narrows the scope of debt management operations and, essentially, in this case the sustainable debt level will be much lower than the possible level if debt accumulated at a moderate speed.

Only when the government becomes able to inspire confidence in its future commitments might the risk premium on debt switch to a decline and the government may then gain from opportunities to implement debt management operations.

Sovereign Bond Spread Determinants

Sovereign bond spreads, financial markets determinants – spread regressions by country

The dataset

We use daily data obtained directly from *Bloomberg* and *ThompsonReuters*. In general the data set for each country starts around mid-2006 and ends at mid-2012, comprising about 1600 observation per country. Technically the estimation is executed in Microfit 4.1 and EViews 6.

The model and methodological issues

A potential default is often mostly associated with an increase in yield spreads. To examine the determinants of sovereign bond spreads we estimate an equation for the sovereign bond spread (as dependent variable) determined by a range of exogenous variables.

Furthermore we assess the long-term determinants and short-run dynamics (error-correction model) of the sovereign bond spreads of Bulgaria, Croatia, Hungary, Kazakhstan, Poland, Russia, Serbia, and Ukraine – these are the relevant countries for which we have managed to obtain meaningful data, both statistically and economically. Likewise, we gain some additional understanding of the convergence process. Based on this specification we may be able to illustrate quantitatively the impact improved investors' confidence may have upon financing conditions as depicted by government bond spreads.

Sampling frequency – daily

Estimated equation:

eq. 32 $$\boldsymbol{SSEMBI_t = \alpha + \beta VIX_t + \gamma CDS_t + \varepsilon_t}$$

where:

SSEMBI--Stripped Spread JPM EMBI GLOBAL

VIX – Volatility Index (proxy for global risk aversion)

CDS – Credit Default Swap (perceived individual country risk)

Estimation of the model

We start with estimating the model on an individual basis -- country by country -- and then we move to panel data (cross-sectional-time-series) estimation.

Our motivation for using a framework allowing for fractionally integrated variables (ARDL) is based on various factors, including:

- The conventional (dichotomous) choice between unit root I(1) and level stationarity I(0) is overly restrictive – many economic time series show signs of being neither I(0) nor I(1)
- Much more general and flexible apparatus than the traditional approach
- Important for modelling a wide range of macroeconomic relationships
- The standard practice of taking first differences may still lead to series with a component of long memory behaviour

Many researchers are accustomed to think in terms of the stationarity of any time series used in the construction of whichever econometric model is being developed. As the assumption of stationarity is an important one, non-stationary time series are commonly transformed to stationary ones by differencing. This would suggest that a model specified in differences of economic time series should be favoured for finding estimates of parameters. But one of the important notions in macroeconomics is the concept of the existence of a long-run equilibrium relationship. Theoretically in steady-state equilibrium economic variables remain unchanged, until the system is shocked. Therefore, if such an equilibrium relationship is specified in first differences, the steady-state differences would be zero and there is no solution.

Hence, in what follows we apply the (Autoregressive Distributed Lag) ARDL procedure developed by Pesaran and Shin (Pesaran and Shin 1995). A detailed, step by step, account of this procedure was provided in Chapter II of the thesis.

Table 27: Sovereign bond yield spreads, financial markets determinants: June 2006 – June 2012, daily

Bulgaria

eq. 33 **SSEMBI = -77.4299 INPT + 0.38379 CDS + 9.9309 VIX - 0.044895 ECM (-1)**

(-6.2919) (7.9586) (13.6259) (-8.3508)

No. obs: 1667
Joint test of zero restrictions on the coefficients of additional variables:
Lagrange Multiplier Statistic CHSQ(3) = 27.2769[.000]
Likelihood Ratio Statistic CHSQ(3) = 27.5043[.000]
F Statistic **F(3,1614) = 9.0212[.000]**
R-bar-squared: **0.2137**
DW-statistics: **2.0085**

The results of the F-statistic for the joint test of zero restrictions on the coefficients of additional variables for Bulgaria reject the null hypothesis in favour of the existence of long-run relationship between SSEMBI, CDS and VIX. We estimate eq.32 and get the long-run coefficient; then we obtain the estimates of the error correction model associated with these long-run estimates and report the outcome as eq.33 above. All the explanatory variables are strongly significant (t-ratios shown in parenthesis) and with the expected sign. One point increase in the Bulgaria's risk (approximated by the CDS) would lead to increase of about 0.38 basis points in the dependent variable SSEMBI (Bulgaria's bond's spread) *ceteris paribus*. If the global risk aversion (proxied by VIX) goes up by one point an increase of about 9.9 basis points in SSEMBI would be induced everything else remaining the same. The error correction coefficient of about -0.045 implies just less than 15 working days half-life to equilibrium of the Bulgarian bond spread. The coefficient for mutual determination corrected for degrees of freedom equals 0.2137 suggesting that about 21 per cent of variability in the dependent variable is explained.

Croatia

Non-stationary variables, and the lack of a cointegrating relationship, is not rejected by the joint test for zero restrictions on the coefficients of the lagged level variables

Hungary

eq. 34 **SSEMBI = -24.369 INPT + 0.82123 CDS + 3.9391 VIX - 0.0416385 ECM (-1)**

(-1.3285) **(18.3975)** **(4.8582)** **(-6.3525)**

No. obs: 1662
Joint test of zero restrictions on the coefficients of additional variables:
Lagrange Multiplier Statistic CHSQ(3) = 158.6390[.000]
Likelihood Ratio Statistic CHSQ(3) = 166.8028[.000]
F Statistic **F(3,1608) = 57.0919[.000]**
R-bar-squared: **0.0675**
DW-statistics: **1.8846**

The results of the F-statistic for the joint test of zero restrictions on the coefficients of additional variables for Hungary reject the null hypothesis in favour of the existence of long-run relationship between SSEMBI, CDS and VIX. We estimate eq.32 and get the long-run coefficient; then we obtain the estimates of the error correction model associated with these long-run estimates and report the outcome as eq.34 above. All the explanatory variables are strongly significant (t-ratios shown in parenthesis) and with the expected sign. One point increase in the Hungary's risk (approximated by the CDS) would lead to increase of about 0.82 basis points in the dependent variable SSEMBI (Hungary's bond's spread) *ceteris paribus*. If the global risk aversion (proxied by VIX) goes up by one point an increase of about 3.9 basis points in SSEMBI would be induced everything else remaining the same. The error correction coefficient of about -0.042 implies just less than 17 working days half-life to equilibrium of the Hungarian bond spread. The coefficient for mutual determination corrected for degrees of freedom equals 0.0675 suggesting that just less than 1 per cent of variability in the dependent variable is explained.

Poland

eq. 35 **SSEMBI = -35.8277 INPT + 0.007321 CDS + 8.3595 VIX - 0.0151 ECM (-1)**

(-1.1903) (0.3946) **(6.8532)** **(-4.9359)**

No. obs: 1664
Joint test of zero restrictions on the coefficients of additional variables:
Lagrange Multiplier Statistic CHSQ(3) = 13.5771[.004]
Likelihood Ratio Statistic CHSQ(3) = 13.6332[.003]
F Statistic **F(3,1611) = 4.4527[.004]**
R-bar-squared: **0.0329**
DW-statistics: **2.0014**

The results of the F-statistic for the joint test of zero restrictions on the coefficients of additional variables for Poland reject the null hypothesis in favour of the existence of long-run relationship between SSEMBI, CDS and VIX. We estimate eq.32 and get the long-run coefficient; then we obtain the estimates of the error correction model associated with these long-run estimates and report the outcome as eq.35 above. The explanatory variable VIX and the ECM term are strongly significant (t-ratios shown in parenthesis) and with the expected sign. However, the increase in the Polands's risk effect is too small and not statistically significantly different from zero. If the global risk aversion (proxied by VIX) goes up by one point an increase of about 8.4 basis points in SSEMBI would be induced everything else remaining the same. The error correction coefficient of about -0.015 implies about 45 working days half-life to equilibrium of the Poland bond spread. The coefficient for mutual determination corrected for degrees of freedom equals 0.0329 suggesting that just less than 1 per cent of variability in the dependent variable is explained.

Russia

eq. 36 **SSEMBI = -3.3664 INPT + 0.6300 CDS + 6.0133 VIX - 0.0417 ECM (-1)**

(-0.1722) **(8.7187)** **(4.6800)** **(-6.5702)**

No. obs: 1642
Joint test of zero restrictions on the coefficients of additional variables:
Lagrange Multiplier Statistic CHSQ(3) = 31.6218[.000]
Likelihood Ratio Statistic CHSQ(3) = 31.9328[.000]
F Statistic **F(3,1589) = 10.4853[.000]**
R-bar-squared: **0.4946**
DW-statistics: **1.9889**

The results of the F-statistic for the joint test of zero restrictions on the coefficients of additional variables for Russia reject the null hypothesis in favour of the existence of long-run relationship between SSEMBI, CDS and VIX. We estimate eq.32 and get the long-run coefficient; then we obtain the estimates of the error correction model associated with these long-run estimates and report the outcome as eq.36 above. All the explanatory variables are strongly significant (t-ratios shown in parenthesis) and with the expected sign. One point increase in the Russia's risk (approximated by the CDS) would lead to increase of about 0.63 basis points in the dependent variable SSEMBI (Russia's bond's spread) *ceteris paribus*. If the global risk aversion (proxied by VIX) goes up by one point an increase of about 6.0 basis points in SSEMBI would be induced everything else remaining the same. The error correction coefficient of about -0.042 implies just about 17 working days half-life to equilibrium of the Russian bond spread. The coefficient for mutual determination corrected for degrees of freedom equals 0.4946 suggesting that almost exactly 50 per cent of variability in the dependent variable is explained.

Ukraine

eq. 37 **SSEMBI = 8280.6 INPT + 8.0964 CDS - 604.8879 VIX - 0.0008373 ECM (-1)**

(0.15186) (0.16603) (-0.15024) (0.15269)

No. obs: 1641
Joint test of zero restrictions on the coefficients of additional variables:
Lagrange Multiplier Statistic CHSQ(3) = 21.5655[.000]
Likelihood Ratio Statistic CHSQ(3) = 21.7096[.000]
F Statistic **F(3,1588) = 7.1060[.000]**
R-bar-squared: **0.23489**
DW-statistics: **2.0134**

The results of the F-statistic for the joint test of zero restrictions on the coefficients of additional variables for Ukraine reject the null hypothesis in favour of the existence of long-run relationship between SSEMBI, CDS and VIX. We estimate eq.32 and get the long-run coefficient; then we obtain the estimates of the error correction model associated with these long-run estimates and report the outcome as eq.37 above. All the explanatory variables turn out to be statistically insignificant (t-ratios shown in parenthesis) and VIX is with the "wrong" sign. The error correction coefficient of about -0.0008 implies about 866 working days half-life to equilibrium of the Ukraine bond spread, but is statistically insignificant. The coefficient for mutual determination corrected for degrees of freedom equals 0.2348 suggesting that about 23 per cent of variability in the dependent variable is explained. All the explanatory variables being insignificant only in the specific case of Ukraine tend to suggest that the bond spread of the country is driven by other forces, possibly including low quality of governance, corruption and heavy speculation.

Serbia

eq. 38 **SSEMBI = -198.8189INPT + 0.47910CDS + 21.0931VIX - 0.020865ECM (-1)**

(-3.3529) (2.7677) (11.5718) (-5.8916)

No. obs: 1592
Joint test of zero restrictions on the coefficients of additional variables:
Lagrange Multiplier Statistic CHSQ(3) = 50.9643[.000]
Likelihood Ratio Statistic CHSQ(3) = 51.8049[.000]
F Statistic **F(3,1539) = 17.1100[.000]**
R-bar-squared: **0.1965**
DW-statistics: **2.0069**

The results of the F-statistic for the joint test of zero restrictions on the coefficients of additional variables for Serbia reject the null hypothesis in favour of the existence of long-run relationship between SSEMBI, CDS and VIX. We estimate eq.32 and get the long-run coefficient; then we obtain the estimates of the error correction model associated with these long-run estimates and report the outcome as eq.38 above. All the explanatory variables are strongly significant (t-ratios shown in parenthesis) and with the expected sign. One point increase in the Serbia's risk (approximated by the CDS) would lead to increase of about 0.48 basis points in the dependent variable SSEMBI (Hungary's bond's spread) *ceteris paribus*. If the global risk aversion (proxied by VIX) goes up by one point an increase of about 21 basis points in SSEMBI would be induced everything else remaining the same. The error correction coefficient of about -0.020 implies just about 34 working days half-life to equilibrium of the Serbian bond spread. The coefficient for mutual determination corrected for degrees of freedom equals 0.1965 suggesting that just around 20 per cent of variability in the dependent variable is explained.

Kazakhstan

eq. 39 **SSEMBI = -173.21 INPT + 0.3261 CDS + 20.9384 VIX - 0.0417 ECM (-1)**

(-2.5738) (3.3923) (7.3869) (-5.1551)

No. obs: 1292
Joint test of zero restrictions on the coefficients of additional variables:
Lagrange Multiplier Statistic CHSQ(3) = 18.0163[.000]
Likelihood Ratio Statistic CHSQ(3) = 18.1444[.000]
F Statistic **F(3,1239) = 5.9007[.001]**
R-bar-squared: **0.2903**
DW-statistics: **1.9953**

The results of the F-statistic for the joint test of zero restrictions on the coefficients of additional variables for Kazakhstan reject the null hypothesis in favour of the existence of long-run relationship between SSEMBI, CDS and VIX. We estimate eq.32 and get the long-run coefficient; then we obtain the estimates of the error correction model associated with these long-run estimates and report the outcome as eq.39 above. All the explanatory variables are strongly significant (t-ratios shown in parenthesis) and with the expected sign. One point increase in the Kazakhstan's risk (approximated by the CDS) would lead to increase of about 0.33 basis points in the dependent variable SSEMBI (Kazakhstan's bond's spread) *ceteris paribus*. If the global risk aversion (proxied by VIX) goes up by one point an increase of about 21 basis points in SSEMBI would be induced everything else remaining the same. The error correction coefficient of about -0.042 implies just about 16 working days half-life to equilibrium of the Kazakhstan bond spread. The coefficient for mutual determination corrected for degrees of freedom equals 0.2903 suggesting that about 29 per cent of variability in the dependent variable is explained.

Sovereign bond spreads, financial markets determinants: cross sectional time series estimate – pooled least squares

The cross-sectional-time-series (CSTS) data contains valuable information about both: i) changes between the subjects (cross-sectional information); and, ii) changes within the subjects (time-series information).

Turning to the panel data model (see Table 30**,** below), first we perform series of unit-root tests, on the basis of which, we are not able to reject the presence of unit roots in the data. Next we perform panel cointegration tests, all of which reject the null hypothesis of no cointegration. Hence, given that our variables are cointegrated we proceed with estimating both fixed and random effects (cointegrated panels) models. To simplify and in general, the fixed effects model assumes that each country differs in its intercept term, while the random effects model assumes that each country differs in its error term.

Table 28: Unit root tests

a) Null Hypothesis: Unit root (individual unit root process)
Series: SSBGN, SSHUN, SSPOL, SSRUS, SSSER, SSUKR
Date: 01/13/15 Time: 20:12
Sample: 5/04/2006 6/08/2012
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic selection of lags based on SIC: 0 to 6
Total number of observations: 9533
Cross-sections included: 6

Method	Statistic	Prob.**
Im, Pesaran and Shin W-stat	-0.23493	0.4071

** Probabilities are computed assuming asympotic normality

b) Null Hypothesis: Unit root (individual unit root process)
Series: SSBGN, SSHUN, SSPOL, SSRUS, SSSER, SSUKR
Date: 01/13/15 Time: 20:15
Sample: 5/04/2006 6/08/2012
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic selection of lags based on SIC: 0 to 6
Total number of observations: 9533
Cross-sections included: 6

Method	Statistic	Prob.**
ADmnjjjF - Fisher Chi-square	9.11905	0.6927
ADF - Choi Z-stat	-0.11368	0.4547

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

c) Null Hypothesis: Unit root (common unit root process)
Series: SSBGN, SSHUN, SSPOL, SSRUS, SSSER, SSUKR
Date: 01/13/15 Time: 20:14
Sample: 5/04/2006 6/08/2012
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic selection of lags based on SIC: 0 to 6
Newey-West bandwidth selection using Bartlett kernel
Total number of observations: 9533
Cross-sections included: 6

Method	Statistic	Prob.**
Levin, Lin & Chu t*	0.23601	0.5933

** Probabilities are computed assuming asymptotic normality

d) Null Hypothesis: Unit root (individual unit root process)
Series: CDSBGN, CDSHUN, CDSPOL, CDSRUS, CDSSER, CDSUKR
Date: 01/14/15 Time: 18:22
Sample: 5/04/2006 6/08/2012
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic selection of lags based on SIC: 0 to 19
Total number of observations: 9501
Cross-sections included: 6

Method	Statistic	Prob.**
Im, Pesaran and Shin W-stat	-2.77327	0.0028

** Probabilities are computed assuming asymptotic normality

e) Null Hypothesis: Unit root (individual unit root process)
Series: CDSBGN, CDSHUN, CDSPOL, CDSRUS, CDSSER, CDSUKR
Date: 01/14/15 Time: 18:26
Sample: 5/04/2006 6/08/2012
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic selection of lags based on SIC: 0 to 19
Total number of observations: 9501
Cross-sections included: 6

Method	Statistic	Prob.**
ADF - Fisher Chi-square	54.2077	0.0000
ADF - Choi Z-stat	-2.57448	0.0050

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

f) Null Hypothesis: Unit root (common unit root process)
Series: CDSBGN, CDSHUN, CDSPOL, CDSRUS, CDSSER, CDSUKR
Date: 01/14/15 Time: 18:24
Sample: 5/04/2006 6/08/2012
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic selection of lags based on SIC: 0 to 19
Newey-West bandwidth selection using Bartlett kernel
Total number of observations: 9501
Cross-sections included: 6

Method	Statistic	Prob.**
Levin, Lin & Chu t*	0.66475	0.7469

** Probabilities are computed assuming asymptotic normality

g) Null Hypothesis: Unit root (individual unit root process)
Series: VIXBGN, VIXHUN, VIXPOL, VIXRUS, VIXSER, VIXUKR
Date: 01/14/15 Time: 18:33
Sample: 5/04/2006 6/08/2012
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic selection of lags based on SIC: 2
Total number of observations: 9530
Cross-sections included: 6

Method	Statistic	Prob.**
Im, Pesaran and Shin W-stat	-4.86102	0.0000

** Probabilities are computed assuming asymptotic normality

h) Null Hypothesis: Unit root (individual unit root process)
Series: VIXBGN, VIXHUN, VIXPOL, VIXRUS, VIXSER, VIXUKR
Date: 01/14/15 Time: 18:34
Sample: 5/04/2006 6/08/2012
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic selection of lags based on SIC: 2
Total number of observations: 9530
Cross-sections included: 6

Method	Statistic	Prob.**
ADF - Fisher Chi-square	48.1221	0.0000
ADF - Choi Z-stat	-5.12922	0.0000

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

i) Null Hypothesis: Unit root (common unit root process)
Series: VIXBGN, VIXHUN, VIXPOL, VIXRUS, VIXSER, VIXUKR
Date: 01/14/15 Time: 18:34
Sample: 5/04/2006 6/08/2012
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic selection of lags based on SIC: 2
Newey-West bandwidth selection using Bartlett kernel
Total number of observations: 9530
Cross-sections included: 6

Method	Statistic	Prob.**
Levin, Lin & Chu t*	-2.81335	0.0025

** Probabilities are computed assuming asymptotic normality

Table 29: Pedroni Residual Cointegration Test

Pedroni Residual Cointegration Test
Series: SS? CDS? VIX?
Date: 01/13/15 Time: 20:00
Sample: 5/04/2006 6/08/2012
Included observations: 1592
Cross-sections included: 6
Null Hypothesis: No cointegration
Trend assumption: No deterministic trend
Lag selection: fixed at 1
Newey-West bandwidth selection with Bartlett kernel

Alternative hypothesis: common AR coefs. (within-dimension)
Weighted

	Statistic	Prob.	Statistic	Prob.
Panel v-Statistic	28.64915	0.0000	11.19017	**0.0000**
Panel rho-Statistic	-28.67736	0.0000	-17.61534	**0.0000**
Panel PP-Statistic	-12.43802	0.0000	-8.880309	**0.0000**
Panel ADF-Statistic	-9.136756	0.0000	-7.728234	**0.0000**

Alternative hypothesis: individual AR coefs. (between-dimension)

	Statistic	Prob.
Group rho-Statistic	-26.71138	0.0000
Group PP-Statistic	-13.06744	0.0000
Group ADF-Statistic	-10.82616	0.0000

Cross section specific results

Phillips-Peron results (non-parametric)

Cross ID	AR(1)	Variance	HAC	Bandwidth	Obs
BGN	0.926	251.0947	215.8437	1.00	1591
HUN	0.946	239.8555	269.1306	10.00	1589
POL	0.965	250.6194	167.3063	25.00	1591
RUS	0.920	238.9687	222.7708	11.00	1591
SER	0.961	1121.054	677.9342	7.00	1591
UKR	0.896	3735.864	3511.652	15.00	1591

Augmented Dickey-Fuller results (parametric)

Cross ID	AR(1)	Variance	Lag	Max lag	Obs
BGN	0.937	245.4598	1	--	1590
HUN	0.946	239.5916	1	--	1587
POL	0.974	233.7010	1	--	1590
RUS	0.928	236.6343	1	--	1590
SER	0.968	1089.322	1	--	1590
UKR	0.927	3429.777	1	--	1590

Table 30: Kao Residual Cointegration Test

Kao Residual Cointegration Test
Series: SS? CDS? VIX?
hyDate: 01/13/15 Time: 20:06
Sample: 5/04/2006 6/08/2012
Included observations: 1592
Null Hypothesis: No cointegration
Trend assumption: No deterministic trend
Lag selection: fixed at 1
Newey-West bandwidth selection using Bartlett kernel

	t-Statistic	Prob.
ADF	-21.36444	0.0000

Residual variance	277.8210
HAC variance	500.8972

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RESID?)
Method: Panel Least Squares
Date: 01/13/15 Time: 20:06
Sample (adjusted): 5/08/2006 6/08/2012
Included observations: 1590 after adjustments
Cross-sections included: 6
Total pool (unbalanced) observations: 9537

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RESID?(-1)	-0.181642	0.007573	-23.98541	0.0000
D(RESID?(-1))	-0.502852	0.008854	-56.79385	0.0000

R-squared	0.389329	Mean dependent var	0.070368
Adjusted R-squared	0.389265	S.D. dependent var	144.8971
S.E. of regression	113.2364	Akaike info criterion	12.29704
Sum squared resid	1.22E+08	Schwarz criterion	12.29854
Log likelihood	-58636.45	Hannan-Quinn criter.	12.29755
Durbin-Watson stat	2.171898		

Hence, we proceed to estimate a fixed effect (FE) model (Table 31, below)

Table 31: Pooled Least Squares Fixed Effects Model, Estimation Results

Dependent Variable: SS?
Method: Pooled Least Squares
Date: 01/14/15 Time: 13:35
Sample: 5/04/2006 6/08/2012
Included observations: 1591
Cross-sections included: 6
Total pool (balanced) observations: 9546

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-31.91908	4.139766	-7.710360	0.0000
CDS?	**0.424554**	**0.004007**	**105.9562**	0.0000
VIX?	**10.13878**	**0.169247**	**59.90516**	0.0000
Fixed Effects (Cross)				
BGN--C	-62.44306			
HUN--C	-51.47301			
POL--C	-118.8528			
RUS--C	-32.03785			
SER--C	99.14332			
UKR--C	165.6634			

Effects Specification

Cross-section fixed (dummy variables)			
R-squared	0.780282	Mean dependent var	342.4605
Adjusted R-squared	**0.780121**	S.D. dependent var	361.3367
S.E. of regression	169.4354	Akaike info criterion	13.10366
Sum squared resid	2.74E+08	Schwarz criterion	13.10966
Log likelihood	-62535.76	Hannan-Quinn criter.	13.10570
F-statistic	4838.884	Durbin-Watson stat	0.731852
Prob(F-statistic)	0.000000		

The fixed effects coefficients differ in sign and size. Consequently, we test for (unobserved) heterogeneity. The test applied is the standard (in EViews) *Redundant Fixed Effects Tests*, where the null hypothesis is that the fixed effects are all equal to each other.

Table 32: Redundant fixed effects test

Redundant Fixed Effects Tests Pool: POOL01 Test cross-section fixed effects			
Effects Test	Statistic	d.f.	Prob.
Cross-section F	559.253226	(5,9538)	**0.0000**
Cross-section Chi-square	2454.252098	5	**0.0000**

The p-values related to the F-statistic and the Chi-square statistics are both very small, (see Table 32, above) providing strong evidence against the null hypothesis and suggesting the existence of heterogeneity.

Table 33: Residual Correlation Matrix

	BGN	HUN	POL	RUS	SER	UKR
BGN	**1.000000**	0.616180	0.111101	0.833714	0.378806	0.010543
HUN	0.616180	**1.000000**	0.204054	0.742839	0.179843	-0.015597
POL	0.111101	0.204054	**1.000000**	0.146597	-0.060416	-0.075385
RUS	0.833714	0.742839	0.146597	**1.000000**	0.458929	0.097838
SER	0.378806	0.179843	-0.060416	0.458929	**1.000000**	0.761338
UKR	0.010543	-0.015597	-0.075385	0.097838	0.761338	**1.000000**

The correlation matrix indicates that there certainly is correlation observed among cross-sections. Interestingly, Ukraine displays negative correlations with Poland and Hungary, and between Serbia and Poland: an "anti-contagion" effect.

Table 34: Residual Covariance Matrix

	BGN	HUN	POL	RUS	SER	UKR
BGN	**2906.718**	3412.749	1702.920	2866.242	2700.845	134.8261
HUN	3412.749	**10553.35**	5959.585	4866.135	2443.262	-380.0592
POL	1702.920	5959.585	**80826.37**	2657.636	-2271.468	-5083.698
RUS	2866.242	4866.135	2657.636	**4066.196**	3870.088	1479.853
SER	2700.845	2443.262	-2271.468	3870.088	**17488.88**	23882.24
UKR	134.8261	-380.0592	-5083.698	1479.853	23882.24	**56264.30**

The diagonal demonstrates the variances of the residuals for each cross-section in bold; the remaining numbers of the matrix show the covariance of the residuals across cross-sectional units.

Based on the results from tables 34 and 35, above, we explore the opportunity to obtain an efficient estimator (using EGLS with SUR weights) by utilising the correlations between the residuals. The results of the re-estimated model are presented below.

Table 35: Fixed effects model using estimated generalized least squares (EGLS) with seemingly unrelated regression (SUR) weights

Dependent Variable: SS?
Method: Pooled EGLS (Cross-section SUR)
Date: 01/14/15 Time: 13:46
Sample: 5/04/2006 6/08/2012
Included observations: 1591
Cross-sections included: 6
Total pool (balanced) observations: 9546
Linear estimation after one-step weighting matrix

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	14.87775	2.999460	4.960143	0.0000
CDS?	**0.417642**	**0.002665**	**156.7225**	0.0000
VIX?	**8.265180**	**0.123106**	**67.13875**	0.0000
Fixed Effects (Cross)				
BGN--C	-63.15626			
HUN--C	-51.96075			
POL--C	-119.9469			
RUS--C	-32.85247			

SER--C	98.86306		
UKR--C	169.0533		
	Effects Specification		
Cross-section fixed (dummy variables)			
	Weighted Statistics		
R-squared	0.844508	Mean dependent var	1.607103
Adjusted R-squared	**0.844394**	S.D. dependent var	2.841986
S.E. of regression	0.983804	Sum squared resid	9231.543
F-statistic	7400.421	Durbin-Watson stat	0.343481
Prob(F-statistic)	0.000000		
	Unweighted Statistics		
R-squared	0.776572	Mean dependent var	342.4605
Sum squared resid	2.78E+08	Durbin-Watson stat	0.691820

The estimates of CDS and VIX are to some extent smaller, but as the heteroscedasticity EGLS is more efficient than OLS estimator the standard error of CDS and VIX are less significant.

Next we experiment with estimating a random effects (RE) model (Table 36, below)

Table 36: Random Effects Model, Estimation Results

Dependent Variable: SS?
Method: Pooled EGLS (Cross-section random effects)
Date: 01/14/15 Time: 15:25
Sample: 5/04/2006 6/08/2012
Included observations: 1591
Cross-sections included: 6
Total pool (balanced) observations: 9546
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-31.80419	12.44861	-2.554839	0.0106
CDS?	**0.426632**	**0.003996**	**106.7746**	0.0000
VIX?	**10.10665**	**0.169184**	**59.73777**	0.0000
Random Effects (Cross)				
BGN--C	-60.89944			
HUN--C	-50.22998			
POL--C	-115.9926			
RUS--C	-31.11365			
SER--C	97.10691			
UKR--C	161.1287			
	Effects Specification			

	S.D.	Rho
Cross-section random	28.75731	0.0280
Idiosyncratic random	169.4354	0.9720

Weighted Statistics

R-squared	0.702054	Mean dependent var	50.04312
Adjusted R-squared	**0.701992**	S.D. dependent var	311.4249
S.E. of regression	170.0072	Sum squared resid	2.76E+08
F-statistic	11243.17	Durbin-Watson stat	0.733375
Prob(F-statistic)	0.000000		

While the regression coefficients obtained are practically identical to those of the fixed effects model, the random effects model presumes that the random effects are uncorrelated with the explanatory variables – if not the estimators would be rendered inconsistent (endogeneity problem). We apply the Hausman test (Correlated Random Effects) to test this hypothesis.

Table 37: Correlated random effects – Hausman test

Correlated Random Effects - Hausman Test
Pool: POOL01
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	66.519114	2	0.0000

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
CDS?	0.424554	0.426632	0.000000	0.0000
VIX?	10.138775	10.106654	0.000021	0.0000

The test (Table 37, above) rejects the null hypothesis at all conventional levels of confidence. Hence, the assumption that the random effects are uncorrelated to the explanatory variables is not acceptable, not allowing us to continue further with this approach.

Sovereign bond spreads, macroeconomic determinants – spread regressions by country

In what follows we move to quarterly data frequency and try to assess the effect of the macroeconomic variables listed below as determinants of the sovereign bond spreads. We continue by applying the ARDL procedure.

SSEMBI -- Stripped Spread JPM EMBI GLOBAL

VIX -- Volatility Index (proxy for global risk aversion)

PDGDP -- Government debt as per cent of GDP (Bulgaria, Croatia and Hungary)

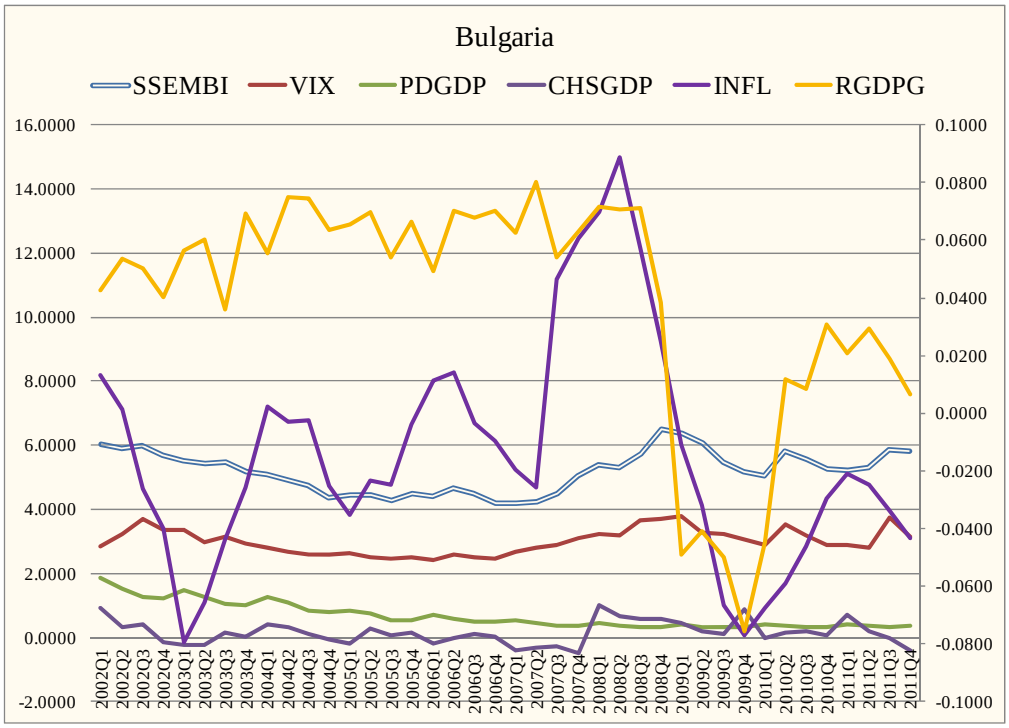
RGDPG -- Real GDP growth

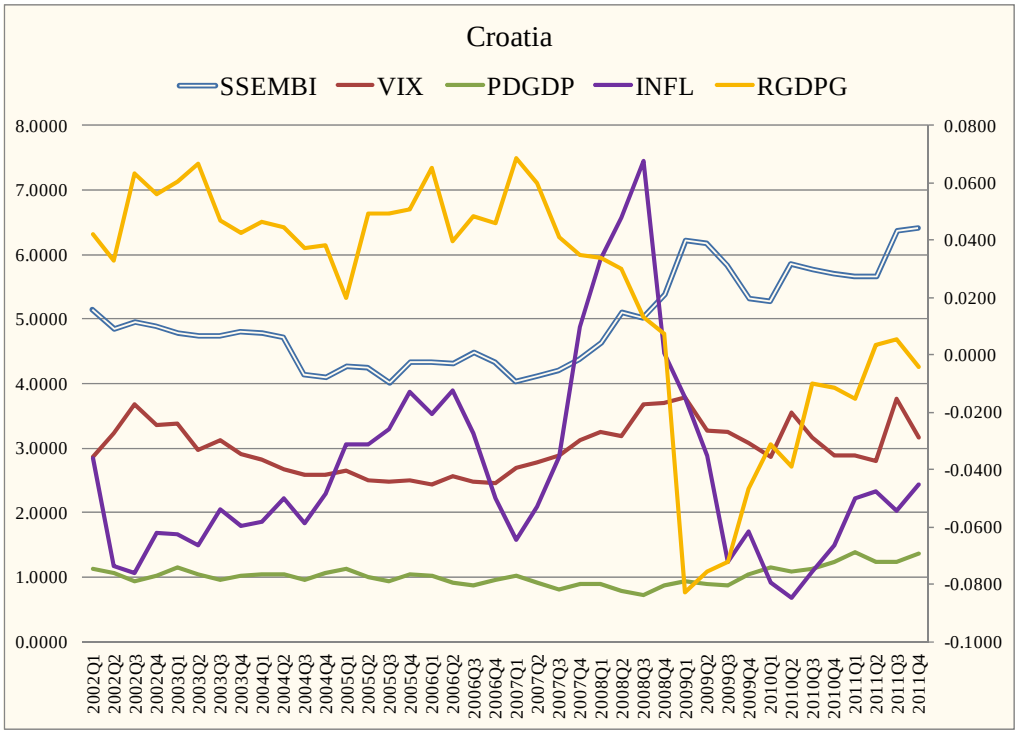
INFL -- Relative change in CPI

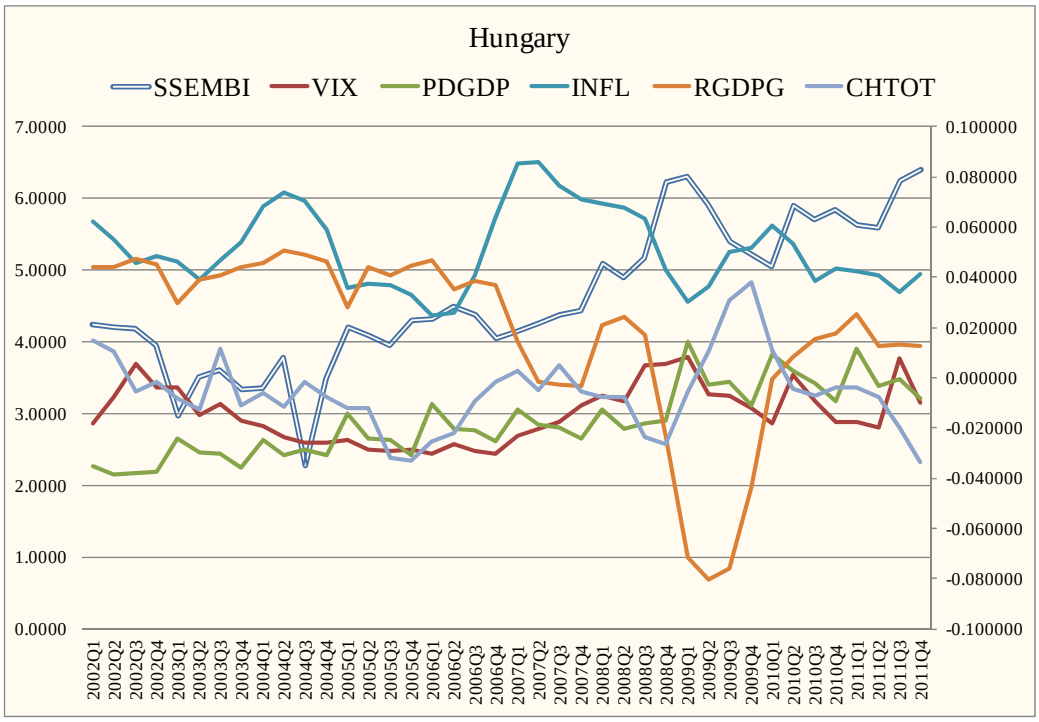
CHTOT – Change in the Terms of Trade (only for Hungary and Poland)

CHOILP – Change in Oil Prices (only for Russia)

Figure 48: Sovereign bond yield spreads, potential macroeconomic determinants: Bulgaria, Croatia, Hungary, Poland, and Russia






Hungary
SSEMBI
VIX
PDGDP
INFL
RGDPG
CHTOT
7.0000
6.0000
5.0000
4.0000
3.0000
2.0000
1.0000
0.0000
0.100000
0.080000
0.060000
0.040000
0.020000
0.000000
-0.020000
-0.040000
-0.060000
-0.080000
-0.100000
2002Q1
2002Q2
2002Q3
2002Q4
2003Q1
2003Q2
2003Q3
2003Q4
2004Q1
2004Q2
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2005Q1
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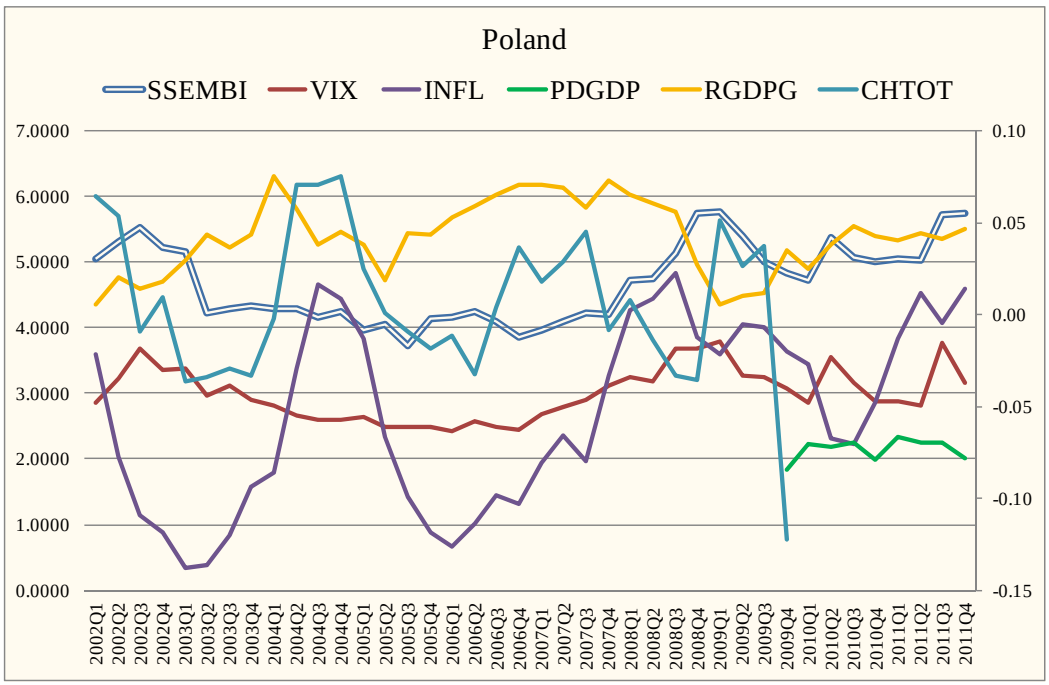
2011Q4


Poland
SSEMBI
VIX
INFL
PDGDP
RGDPG
CHTOT
7.0000
6.0000
5.0000
4.0000
3.0000
2.0000
1.0000
0.0000
0.10
0.05
0.00
-0.05
-0.10
-0.15
2002Q1
2002Q2
2002Q3
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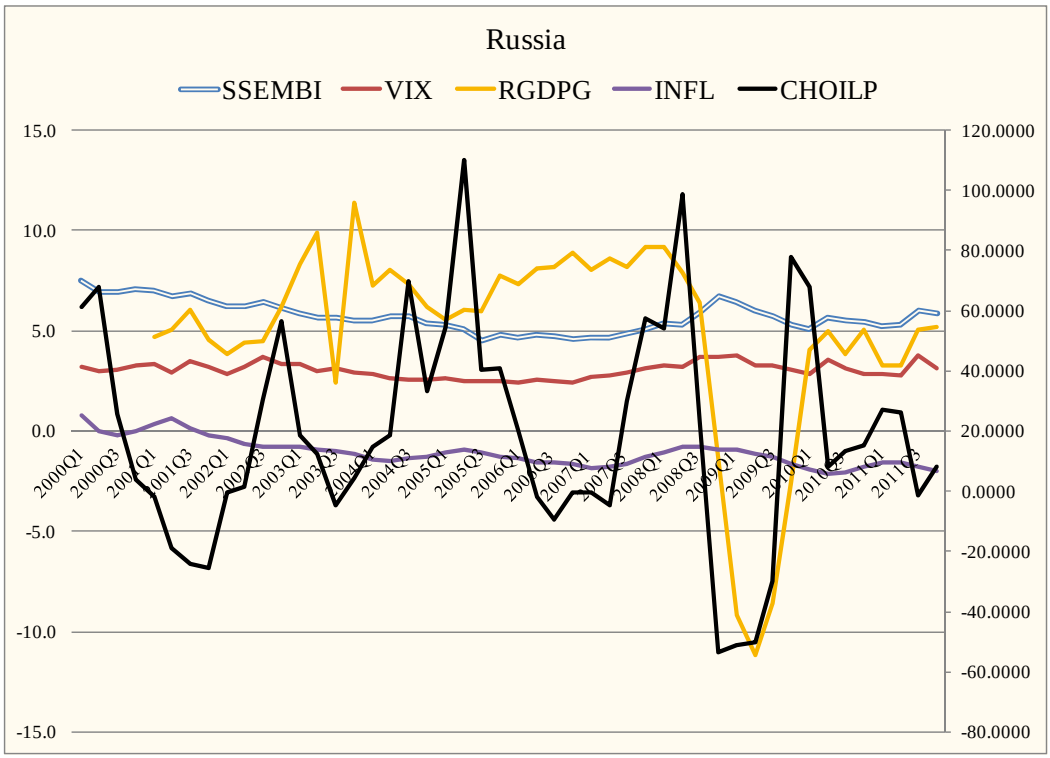
2011Q4



To test the existence of a long-run relationship between variables we estimate the error correction depiction of an underlying ARDL for four countries (Bulgaria, Croatia, Hungary, and Poland) for which there are data (to a degree) available over the period 2002Q2 to 2011Q4.

For Bulgaria and Croatia the ARDL model is:

$$DSSMBI_t = INPT + \sum_{i=1}^{4} \alpha DSSEMBI_{t-i} + \sum_{i=1}^{4} \beta DVIX_{t-i} + \sum_{i=1}^{4} \gamma DPDGDP_{t-i} + \sum_{i=1}^{4} \delta DRGDPG_{t-i} + \sum_{i=1}^{4} \theta DINFL_{t-i} + \pi_1 SSEMBI_{t-1}\ \pi_2 VIX_{t-1} + \pi_3 PDGDP_{t-1} + \pi_4 RGDPG_{t-1} + \pi_5 INFL_{t-1} + \varepsilon_t$$

We test the null hypothesis of the non-existence of a long-run relationship, i.e.,

H_0: $\pi_1 = \pi_2 = \pi_3 = \pi_4 = \pi_5 = 0$

versus

H_1: $\pi_1 \neq 0,\ \pi_2 \neq 0, \pi_3 \neq 0, \pi_4 \neq 0,\ \pi_5 \neq 0$

Bulgaria

Comparing the F-statistic (2.0662) obtained (below) with the critical value bounds determined by Pesaran, Shin and Smith (1996), the critical values at the 90 per cent level are specified as 2.425 to 3.574. Since the F-statistics is below the lower bound of the critical range, we cannot reject the null of no long-run relationship independent of the order of integration of the respective variables.

No. obs: 39
Joint test of zero restrictions on the coefficients of additional variables:
Lagrange Multiplier Statistic CHSQ(5) = 17.2694[.004]
Likelihood Ratio Statistic CHSQ(5) = 22.8087[.000]
F Statistic **F(5, 13) = 2.0662[.135]**
R-bar-squared: 0.6154
DW-statistic: 1.756

Still only for illustrative purposes we estimate the long-run coefficients and their levels of significance (t-statistics):

eq. 40 **SSEMBI = -.19174*INPT + 1.7028*VIX + .15018*PDGDP - .92055*RGDPG +.053177*INFL -.44284*ECM(-1)**

(-0.2468) (**2.8587**) (0.8537) (-0.7010) (1.7650) (**5.7035**)

Croatia

Following the same procedure we obtain:

No. obs: 39
Joint test of zero restrictions on the coefficients of additional variables:
Lagrange Multiplier Statistic CHSQ(5) = 14.7731[.011]
Likelihood Ratio Statistic CHSQ(5) = 18.5678[.002]
F Statistic **F(5, 28) = 3.4148[.016]**
R-bar-squared: 0.47318
DW-statistic: 1.8718

The value of the F-statistic (3.4148) obtained (above) falls within the critical value band (at the 90 per cent level) specified by 2.425 to 3.574. Hence, the results are inconclusive.

Again, only for illustrative purposes we estimate the long-run coefficients and their levels of significance (t-statistics):

eq. 41 **SSEMBI= -1.4081*INPT + 1.3656*VIX + 2.2858*PDGDP - .3836*RGDPG +.20194*INFL -.4093*ECM(-1)**

(-0.9671) **(4.8073)** **(3.1512)** **(-3.8066)** **(-2.5435)** **(-4.1130)**

Next we extend slightly the model to include the change in the terms of trade variable (CHTOT), below, and apply it for Hungary and Poland

$$DSSMBI_t = INPT + \sum_{i=1}^{4} \alpha DSSEMBI_{t-i} + \sum_{i=1}^{4} \beta DVIX_{t-i} + \sum_{i=1}^{4} \gamma DPDGDP_{t-i} + \sum_{i=1}^{4} \delta DRGDPG_{t-i} + \sum_{i=1}^{4} \theta DINFL_{t-i} + \sum_{i=1}^{4} \varphi DCHTOT_{t-i} + \pi_1 SSEMBI_{t-1} + \pi_2 VIX_{t-1} + \pi_3 PDGDP_{t-1} + \pi_4 RGDPG_{t-1} + \pi_5 INFL_{t-1} + \pi_6 CHTOT_{t-1} + \varepsilon_t$$

We test the null hypothesis of the non-existence of a long-run relationship, i.e.,

$H_0: \pi_1 = \pi_2 = \pi_3 = \pi_4 = \pi_5 = \pi_6 = 0$

versus

$H_1: \pi_1 \neq 0,\ \pi_2 \neq 0, \pi_3 \neq 0, \pi_4 \neq 0,\ \pi_5 \neq 0,\ \pi_6 \neq 0$

Hungary:

No. obs: 39
Joint test of zero restrictions on the coefficients of additional variables:
Lagrange Multiplier Statistic CHSQ(6) = 33.4248[.000]
Likelihood Ratio Statistic CHSQ(6) = 108.5336[.000]
F Statistic **F(6, 4) = 14.1462[.011]**
R-bar-squared: 0.3526
DW-statistic: 2.2134

We compare the F-statistic (14.1462) with the critical value bounds determined by Pesaran, Shin and Smith (1996). The critical values at the 99 per cent level are specified by 3.516 to 4.781. Since the F-statistics is above the upper bound of the critical value, we reject the null of no long-run relationship unconnected of the order of integration of the respective variables.

Then based on the Schwartz Bayesian information criteria (SBC) we select the ARDL(1,0,1,0,0,0) model specification and estimate the long-run coefficients; subsequently we estimate the error correction model related to these long-run coefficients and we get:

eq. 42 **SSEMBI = -3.4149*INPT + .93477*VIX + 1.7531*PDGDP - 3.1682*RGDPG + 2.2919*INFL - 24.6521*CHTOT - .59845*ECM(-1)**

(-2.1494) **(2.8587)** **(4.7103)** (-0.6100) (-0.4263) **(-2.5381)** **(-4.2383)**

Not including RGDPG and INFL all other coefficients are statistically significant and with the expected sign. It is interesting to observe that for Hungary the CHTOT is exercising the most substantial effect on SSEMBI, i.e., one unit increase in the terms of trade would lead to an almost

25 basis points reduction in the spread (SSEMBI). The error correction coefficient is strongly significant, has the correct sign and implies a half-life to convergence of about 50 working days.

Poland

The value of the F-statistic (3.6998) attained (below) is just above the higher critical value bound (at the 90 per cent level) specified by 2.425 to 3.574. Hence, at this level, we can reject the null hypothesis of no long run relationship.

No. obs: 39
Joint test of zero restrictions on the coefficients of additional variables:
Lagrange Multiplier Statistic CHSQ(5) = 17.0314[.004]
Likelihood Ratio Statistic CHSQ(5) = 25.6654[.000]
F Statistic **F(5, 13) = 3.6998[.027]**
R-bar-squared: 0.67176
DW-statistic: 2.2495

Next, on the basis of the SBC we select the ARDL(1,2,1,1,0) model specification, then estimate the long-run coefficients and the error-correction model related to them.

eq. 43 **SSEMBI= -1.9125*INPT + .96280*VIX - 7.0988*RGDPG +.17453*INFL + 1.1700*CHTOT -.7010*ECM(-1)**

(3.1198) **(5.4058)** **(-2.5313)** **(2.6459)** (0.8464) **(4.4196)**

With the exception of CHTOT all coefficients are statistically significant and with the expected sign. We observe that for Poland the RGDPG is having the most important effect on SSEMBI, i.e., one unit increase in the terms of trade would lead to about seven basis points reduction in the spread (SSEMBI). The error correction coefficient is strongly significant, has the correct sign and implies a half-life to convergence of about 38 working days.

Finally, we amend somewhat the model to include the change in oil prices variable (CHOILP), and remove the PDGDP (public debt as per cent of GDP – for which we do not have data) below, and apply it for Russia

$$DSSMBI_t = INPT + \sum_{i=1}^{4} \alpha DSSEMBI_{t-i} + \sum_{i=1}^{4} \beta DVIX_{t-i} + \sum_{i=1}^{4} \delta DRGDPG_{t-i} + \sum_{i=1}^{4} \theta DINFL_{t-i} + \sum_{i=1}^{4} \varphi DCHOILP_{t-i} + \pi_1 SSEMBI_{t-1} + \pi_2 VIX_{t-1} + \pi_3 PDGDP_{t-1} + \pi_4 RGDPG_{t-1} + \pi_5 INFL_{t-1} + \pi_6 CHOILP_{t-1} + \varepsilon_t$$

We test the null hypothesis of the non-existence of a long-run relationship, i.e.,

$H_0: \pi_1 = \pi_2 = \pi_3 = \pi_4 = \pi_5 = \pi_6 = 0$

versus

$H_1: \pi_1 \neq 0,\ \pi_2 \neq 0, \pi_3 \neq 0, \pi_4 \neq 0,\ \pi_5 \neq 0,\ \pi_6 \neq 0$

Russia

The value of the F-statistic (3.8821) attained (below) is above the upper critical value bound (at the 90 per cent level) specified by 2.425 to 3.574. Hence, at this level, we can reject the null hypothesis of no long run relationship.

No. obs: 41

Joint test of zero restrictions on the coefficients of additional variables:

Lagrange Multiplier Statistic	CHSQ(5) = 17.9200[.003]
Likelihood Ratio Statistic	CHSQ(5) = 23.5588[.000]
F Statistic	F(5, 25) = 3.8821[.010]

R-bar-squared: 0.62109

DW-statistic: 2.0471

Next, on the basis of the SBC we select the ARDL(1,1,0,0,0) model specification, then estimate the long-run coefficients and the error-correction model related to them.

eq. 44 **SSEMBI = -2.7018*INPT + 2.5998*VIX + .090291*RGDPG -.016650*INFL + 0.00552*CHOILP -.19191*ECM(-1)**

(0.98488) (**2.7383**) (1.4145) (-0.27910) (0.8464) (**2.0286**)

With the exception of VIX all coefficients are not statistically significant and with the "wrong" sign. Interestingly, one of these coefficnts is CHOILP. The error correction coefficient is significant and has the correct sign. However, it implies quite a long half-life to convergence of about 215 working days.

Concluding remarks

First we analyse the financial markets (variables) explanatory power (using proxies for change in market sentiment (VIX) and for adjustment in country's risk (CDS)) over the emerging market bond index spread on a country by country basis.

Using the F-statistic test for joint significance of zero restrictions on the lagged levels of the additional variables (Pesaran, Shin and Smith, 1996) we cannot reject at conventional significance levels the null hypothesis that sovereign bond spreads are cointegrated with the VIX and the country specific CDS[46].

[46] With the single exception of Croatia.

On examination most of the explanatory variables are strongly significant (t-ratios in parenthesis) and have the expected signs. The underlying ARDL equations also pass the diagnostic tests in the majority of cases.

Studying the range of the estimated values we observe that a one point increase in the country's risk (as measured by the CDS) would induce an increase in the region of about half a basis point (ranging from about 0.33 to 0.82) in the dependent variable SSEMBI (bond's spread), everything else remaining the same. If VIX (the proxy for global risk aversion) goes up by one point, this will induce on average about an 11 basis points increase (displaying values from about 3.9 to just above 21) in the country's spread.

The error correction coefficient estimates are within the cluster of –0.015 to -0.044 suggesting a reasonable speed of convergence to equilibrium, with a half-life reporting from fewer than 15 working days to about 45 working days. Hence, in just about two-thirds of a quarter the spread (SSEMBI) should return to its equilibrium. Interestingly, the error correction coefficients and hence the speed of convergence for most of the countries (Bulgaria, Hungary, Russia, and Kazakhstan) is almost one and the same (in the vicinity of –0.042 to -0.044). Therefore it is evident that hypothetically they would converge back to their respective equilibrium values for the SSEMBI more than three times as fast as Serbia and Poland.

The coefficients for mutual determination corrected for degrees of freedom are generally in-between 0.2 to 0.5 suggesting that about 20 to 50 per cent of the variability in the dependent variable (SSEMBI) has been explained. The exceptions are Hungary and Poland, where just about five per cent (on average) of the variability of the respective dependent variable is explained.

Furthermore, for Serbia the tests (for joint significance) suggest that the variables CDS and VIX can be treated as the long-run forcing variables for the dependent variable SSEMBI. Interestingly while this is valid for Serbia, for Poland, Russia and Ukraine our results suggest a bidirectional relationship between CDS (as potential dependent variable) and SSEMBI and VIX, and non-rejection of the null hypothesis that the lagged level variables CDS and SSEMBI do not enter significantly in the potential determination (potential equation) of VIX. In the case of Kazakhstan the null hypothesis that the lagged values of SSEMBI and VIX do not enter significantly in the determination of CDS cannot be rejected, but there is an apparent relationship between VIX and CDS and SSEMBI. Regarding Bulgaria and Hungary we observe complete bidirectional interrelations among all three variables.

In our analysis we estimate separate equations / data generation processes for the various (former centrally planned) economies and find statistically significant and economically perceivable coefficients. The data shortage precluded any potential experimentation with different specifications or another dataset. Hence, if the coefficients tend to be homogenous, pooled panel estimation would be suitable to use.

For this reason we estimate cointegrated pooled panel models. The results from the fixed effects and random effects pooled panel data models are practically identical and are consistent with our previous findings from the individual equation estimates. Concretely, a one point increase in CDS (proxy for country risk) would add about 0.42 basis points to the variable SSEMBI, *ceteris paribus*; whereas a one unit increase of VIX (stand-in for global risk aversion) would bring about an 8.3 basis points increase in SSEMBI. The coefficient of mutual determination corrected for degrees of

freedom is very high, suggesting that about 84 per cent of the variability of the dependent variable (sovereign bond spreads) is explained.

Next we examine the effect of a change in macroeconomic fundamentals on changes of spreads. A relatively noteworthy proportion of fluctuations in transition economies market spreads may be attributed to be driven by country-specific fundamentals. The results imply that improved macroeconomic fundamentals, such as lower ratios of debt to GDP, higher rates of real GDP growth, and low inflation help in reducing sovereign spreads.

For example, reduced indebtedness seems to contribute positively to sovereign spreads in Hungary; one may expect the same to be valid for Poland, but in the case of Poland, the model did not include any measure of indebtedness due to the lack of a time series from (at least) 2001Q1.

It is interesting that in the cases of Bulgaria and Russia we find four insignificant independent variables, whereas these are significant for some of the other countries. This seems to be a possible indication of institutional weakness, limiting the effect of the stance of the macroeconomic aggregates and making their impact trivial. This result is in agreement with Hallerberg and Wolff (2006).

Still, macroeconomic aggregates play a certain role in determining bond spreads, but mostly through the channel of global risk aversion / appetite corroborating Favero and Missale (2011) for our specific set of (CEE and CCA) countries. Hence, it is rather expected that, the only variable which appears in both financial market reaction and macroeconomic fundamentals equations and works strongly and consistently in the same direction is VIX. This may suggest that the levels of spreads may be subject to significant alteration from the impact of financial market volatility (as

measured by VIX) and could potentially be pushed up or down in ways that have little to do with their respective macroeconomic fundamentals.

The error correction coefficients suggest a return to equilibrium (with half-life) in the range of about 38 to 50 working days[47] – a very similar order of magnitude to that derived in the financial market high frequency data sample equations.

Understanding all the critical factors that have a significant influence on the variation in spreads is of the upmost importance. If in reality worldwide factors are principally responsible for the time-series alteration, then any kind of government intervention to bring down spreads may prove ineffective, unless strongly determined and unfalteringly pre-coordinated. On the other hand, if the drivers of market spread fluctuations are country specific then such issues should be taken into account in monitoring macroeconomic developments and trying to assess investors' perception of country specific risks.

[47] With the exception of Russia where the half-life is about 215 working days

Chapter IV: Qualifications and Conclusions

Data availability and data integrity

Using data from transition economies necessitate careful discussion of its quality and consistency. These data may sometimes be characterised from pointless, through distorted, to completely inaccurate. Statistical and book-keeping standards under the socialist economic system have been very different from those commonly accepted in Western Europe. It has taken time to learn and understand it and to switch to the accepted international statistical standards.

Much of the necessary fundamental data are still to be composed and / or disclosed and made easily available to the public. We hope to provide an impetus to serious data collection and complete disclosure for all transition economies for enabling deep economic analysis and informing consistent policy-making (all data files compiled by us will be made available at the eThesis Repository). The situation on the statistical front is made even more complex by the supranational economic institutions (e.g., IMF and WB) practice not to distribute all the data they have (see Annex 2) and to avoid publishing the data they hand out in high frequencies[48] (quarterly and monthly). Moreover, the data published in the International Financial Statistics (IFS) and the World Economic Outlook (WEO) formats may and do differ, with access to the full database available only to internal IMF staff.

Tables 38 to 40 including (below) illustrate the data availability for the group of countries we examine.

[48] The data frequency used may have potentially significant effects on empirical results. Of course there are pros and cons – if low frequency data is used it may not be able to grasp the dynamic changes/variability in the data generation process, whereas if daily or weekly data is analysed, it may lead to an incorrect association of bond spreads and CDS observations, particularly at a time when market activity is low and trades take place infrequently.

Table 38: Macroeconomic aggregates, Quarterly – Data Availability

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
		Gross Domestic Product, Nominal, National currency, millions	Gross Domestic Product, Deflator, Index, 2010=100	Consumer Prices, All items, Index, 2010=100	Consumer Prices, All items; Percent Change over Corresponding Period of Previous Year	General Govt. Public Sector Debt (PSDGG)	Cash surplus/deficit, Cash (Budg. Cen. Govt.) National Currency Millions	Saving, Gross, Nominal, National Currency, millions	Import Prices, All Commodities, Index 2010=100	Export Prices, All Commodities, Index 2010=100	National Currency per U.S. Dollar, period average	Gross capital outflows (portfolio investment assets+ direct investment assets+ other investment assets)	Official reserves
1	Albania	2009Q1-13Q3	--	2000Q1-14Q3	--	2009Q3-14Q2	--	--	--	--	2000Q1-14Q3	--	--
2	Armenia	2000Q1-14Q2	--	2000Q1-14Q3		--	--	--	--	--	2000Q1-08Q4	--	--
3	Azerbaijan	2001Q1-13Q4	--	--	2000Q1-14Q2	--	--	--	--	--	2000Q1-14Q3	--	--
4	Belarus	2000Q1-14Q1	--	--	2000Q1-14Q3	--	--	--	--	--	2000Q1-14Q3	--	--
5	BiH	--	--	2006Q1-13Q4	--	--	--	--	--	--	2000Q1-14Q3	--	--
6	Bulgaria	2000Q1-14Q2	2000Q1-13Q4	2000Q1-14Q3	2000Q1-14Q3	2008Q1-14Q1	--	2000Q1-13Q4	--	--	2000Q1-14Q3	--	--
7	Croatia	2000Q1-14Q2	2000Q1-14Q2	2000Q1-14Q3	--	2000Q4-14Q2	--	--	--	--	2000Q1-14Q3	--	--
8	Czech Republic	2000Q1-14Q2	2000Q1-14Q2	2000Q1-14Q3	2000Q1-14Q3	2000Q1-14Q1	--	2000Q1-14Q2	--	--	2000Q1-14Q3	--	--
9	Estonia	2000Q1-14Q1	2000Q1-14Q2	2000Q1-14Q3	2000Q1-14Q3	2000Q1-14Q1	--	2000Q1-14Q1	--	--	2000Q1-14Q3	--	--
10	Georgia	2000Q1-14Q2	2000Q1-14Q2	2000Q1-14Q3	2000Q1-14Q3	2009Q3-14Q2	--	--	--	--	2000Q1-14Q3	--	--
11	Hungary	2000Q1-14Q2	2000Q1-14Q2	2000Q1-14Q2	2000Q1-14Q1	--	--	--	2000Q1-14Q2	2000Q1-14Q2	2000Q1-14Q3	--	--
12	Kazakhstan	2000Q1-13Q3	--	2000Q1-14Q1	2000Q1-14Q1	--	--	--	--	--	2000Q1-14Q3	--	--
13	Kyrgyz Republic	2000Q1-14Q2	2000Q1-14Q2	2000Q1-14Q2	2000Q1-14Q2	--	--	--	--	--	2000Q1-14Q3	--	--
14	Latvia	2000Q1-14Q2	2000Q1-14Q2	2000Q1-14Q3	2000Q1-14Q3	2000Q1-14Q3	--	2000Q1-14Q2	--	--	2000Q1-14Q3	--	--
15	Lithuania	2000Q1-14Q2	2000Q1-14Q2	2000Q1-14Q3	2000Q1-14Q3	2005Q1-14Q2	--	--	--	--	2000Q1-14Q3	--	--
16	Macedonia	2003Q1-13Q4	2004Q1-13Q4	2000Q1-14Q3	2000Q1-14Q3	--	--	--	--	--	2000Q1-14Q3	--	--
17	Moldova	2000Q1-13Q4	--	2000Q1-14Q3	2000Q1-14Q3	2009Q3-14Q2	--	--	--	--	2000Q1-14Q3	--	--
18	Montenegro	--	--	2005Q1-14Q1	2006Q1-14Q1	--	--	--	--	--	2000Q1-14Q3	--	--
19	Poland	2000Q1-14Q2	2000Q1-14Q2	2000Q1-14Q3	2000Q1-14Q3	2009Q4-14Q1	--	--	2000Q1-09Q4	2000Q1-09Q4	2000Q1-14Q3	--	--
20	Romania	2000Q1-14Q2	2000Q1-13Q4	2000Q1-14Q3	2000Q1-14Q3	2009Q2-14Q2	--	--	--	--	2000Q1-14Q3	--	--
21	Russian Federation	2000Q1-14Q2	2000Q1-14Q2	2000Q1-14Q3	2000Q1-14Q3	2005Q2-08Q4	--	--	--	--	2000Q1-14Q3	--	--
22	Serbia	2001Q1-14Q1	2001Q1-14Q1	2000Q1-14Q3	2000Q1-14Q3	--	--	--	--	--	2000Q1-14Q3	--	--
23	Slovakia	2000Q1-14Q2	2000Q1-14Q2	2000Q1-14Q3	2000Q1-14Q3	2006Q4-14Q2	--	--	--	--	2000Q1-14Q3	--	--
24	Slovenia	2000Q1-14Q2	2000Q1-14Q2	2000Q1-14Q3	2000Q1-14Q3	--	--	2000Q1-14Q1	--	--	2000Q1-14Q3	--	--
25	Tajikistan	--	--	2000Q2-13Q4	2001Q1-13Q4	--	--	--	--	--	2000Q1-14Q3	--	--
26	Turkmenistan	--	--	--	--	--	--	--	--	--	--	--	--
27	Ukraine	2000Q1-14Q2	2001Q1-14Q1	2000Q1-14Q3	2000Q1-14Q3	--	--	--	--	--	2000Q1-14Q3	--	--
28	Uzbekistan	--	--	--	--	--	--	--	--	--	--	--	--

Source: International Financial Statistics, IMF eLibrary (accessed December 2014)

Table 39: JPM EMBI Global Stripped Spread[49], Daily -- Data Availability

		From	to	obs
1	Bulgaria	29/07/1994	05/11/2012	4767
2	Poland	24/10/1995	05/11/2012	4445
3	Croatia	30/08/1996	05/11/2012	4222
4	Russia	31/12/1997	05/11/2012	3874
5	Hungary	29/01/1999	05/11/2012	3592
6	Ukraine	31/05/2000	05/11/2012	3244
7	Serbia	01/07/2005	05/11/2012	1917
8	Kazakhstan	29/06/2007	05/11/2012	1398
9	Georgia	30/06/2008	05/11/2012	1136
10	Lithuania	31/11/2009	05/11/2012	766
11	Belarus	30/09/2010	05/11/2012	548
12	Romania	29/02/2012	05/11/2012	179

Source: DataStream (accessed November 2012)

Table 40: Credit Default Swaps (CDS USD 5Y), Daily – Data Availability

		From	to	obs
1	Bulgaria	17/10/2005	19/11/2012	1405
2	Poland	25/01/2006	19/11/2012	1339
3	Croatia	02/12/2005	19/11/2012	1374
4	Russia	24/02/2006	19/11/2012	1576
5	Hungary	21/10/2005	19/11/2012	1324
6	Ukraine	27/02/2006	19/11/2012	1508
7	Serbia	04/05/2006	19/11/2012	1065
8	Kazakhstan	03/04/2007	10/10/2012	1243

Source: Bloomberg (accessed November 2012)

[49] *Note: Time until maturity -- Of the issues with at least a current face amount outstanding of US$500 million, only those instruments with at least 2½ years until maturity are considered for inclusion. Once added, an instrument may remain in the EMBI Global until 12 months before it matures. On the month-end preceding this anniversary, the instrument is removed from the EMBI Global (JP Morgan Securities Inc, Introducing the JP Morgan Emerging Markets Global (EMBI Global), 1999, New York).*

While we have only been able to use data at the intersection of the table 38 and table 39 for daily frequencies empirical analysis and no more than the data, which overlap in tables 38, 39, and 40 (for quarterly data estimates), we have been careful not to push our analysis beyond what both available and reliable data-series would possibly support.

Conclusions

We aim to clarify and possibly resolve some of the controversies related to economic policies in transition and to try to envisage the potential future tendencies.

First: has the transition ended? It is debatable, and an agreement on the appraisal of the results of transition is impractical as there are expectations, attitudes and beliefs involved. A number of verdicts are on record on this issue and their definitions differ considerably: Kornai, (1999) concludes that this would be a position where the communist parties are not in power, and most of the GDP is produced by the private sector coordinated by the market. According to this description the transition is over (and has been so for the last twenty years); Gelb, (1999) sees the end of transition as a state when the problems and the policy issues confronted by today's transition countries resemble those faced by other countries at similar levels of development. From this starting point it is also arguable that the transition is over; and Svejnar, (2001) states: "I would define the end of transition as a state when these economies replace central planning by a functioning market system and when they generate rapid and sustainable rates of economic growth that enable them to interact with the more advanced market economies without major forms of protection."

What would be the appropriate criteria? Obvious cases to look at for constructive suggestions would be Japan, South Korea and China. In their cases it seemed to be self-evident: supreme economic success guided by the respective government (developmental state). Considering transition (former centrally planned) economies; whatever their pros and cons; neither of them matches the remarkable economic growth achieved by the previous group. Why might that be? The answer is closely linked to the quality of governance, human capital development and corruption, and as a

result the level of development of the social knowledge and its practical implementation, i.e., this generally is manifested by the stage of development of manufacturing[50].

Transition would then end when the former centrally planned economies find their place in the global production process and become equal partners with the industrialised world economies -- to become integrated into the international economic framework rather than to be subordinated to it. This would depend on their abilities in developing and exploiting knowledge in the contemporary exceptionally competitive world economy. Contemporary economic development is related to the historical features of people's ancestors, together with their past knowledge and experience.

If Government maintains strong incentives to provide public goods and retains motivation for wealth creation through the efficient use of capital and labour, as an outcome, the economy would remain connected to its comparative advantage, which (for a low-rent country) lies initially in labour-intensive manufactured goods. The brief initial dependence on primary product exports (of low-rent economies) encourages industrialization at a relatively low per capita income, which is therefore labour-intensive and competitive and triggers a beneficial economic advancement. Moreover, competitive diversification increases the capacity of the economy to cope with economic shocks and reinforces the resilience that arises from sustained high rates of investment. Furthermore, "Modern economic growth is a process of continuous technological innovation, industrial upgrading and economic diversification. No country in the world has been able to move from low- to middle- and high-income status without undergoing the process of industrialization.

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50 "Does Manufacturing Still Matter? Manufacturing's share of global value added has declined steadily over the past nearly 30 years as the global value added of services has grown. In 1985, manufacturing's share of global value added was 35%. By 2008, it had declined to 27%. Services grew from 59% to 70% over the same period. This trend has largely been driven by developed country economies with typically higher wages. According to a recent United Nations Industrial Development Organization (UNIDO) report, this can be explained by the decrease in relative prices of consumption goods, in conjunction with the simultaneous growth of the demand for services.

An added explanation is the often-cited multiplier effect of manufacturing on services jobs. The US Department of Commerce, Bureau of Economic Analysis indicates that manufacturing has a higher multiplier effect on the US economy than any other sector with US$ 1.40 in additional value added in other sectors for every US$ 1.00 in manufacturing value added. If manufacturing is having a multiplier effect on services while simultaneously reducing the prices of manufactured goods, services should indeed be growing more rapidly, assuming manufacturing is also growing (World Economic Forum Report, 2012)"

Structural transformation is always taking place because of changes in technology, in comparative advantage, and in the global economy. There is a need for some guiding principles on how "best" any society should move its human, capital and financial resources from low- to high-productivity sectors. For the process to be efficient, coordination issues and externality issues must be addressed. Markets typically do not manage such structural transformations on their own well (Stigltz, Lin and Monga, 2013)." Government can enhance the economic performance of firms through direct involvement in corporate governance[51].

Second: What do break-ups do to countries? Through our empirical analysis of the economic costs and benefits of secession in CEE and CCA countries we endeavour to provide an answer to this interesting and important (to economics and beyond) question. We focus our analysis on the Former Yugoslavia, and the Former Soviet Union (and their ex-republics and the respective successors' independent states), plus Czechoslovakia. As controls we employ Bulgaria, Poland, Hungary, and Romania. In our estimate the breakup countries experienced deeper and generally shorter economic crises (transition period) in comparison with the control countries (Bulgaria, Hungary, Poland and Romania). However, they have tended to grow afterwards predominantly faster and have managed to add, on average, a similar or higher amount (in 1990 international GK USD per capita) than the control countries. Furthermore, the evidence shows that when rich countries leave the former union they grow and develop much faster, e.g., Slovenia, Estonia, Latvia, and Lithuania.

Third: What is the prospect for economic convergence; do we observe economic convergence? If sigma shows divergence and beta is too slow can we help to reverse the former and speed up the latter?

[51] "Recent years have seen resurgence in the development of industrial policies by governments in the UK and overseas. In the UK, industrial policies have been developed in 11 sectors, led in most cases by groups from the public and private sectors, with many of these encompassing manufacturing industries. [...] In summary, manufacturing is too important to leave to its own devices (Sir Richard Lapthorne, Foresight, 2013)."

Our study provided evidence to the effect that: i) poorer CEE and CCA countries are growing faster than the relatively richer ones; hence there is absolute convergence; ii) when control variables are included into our model larger (negative) coefficients are displayed, supporting the phenomenon of conditional convergence.; iii) we estimate the speed of unconditional convergence to the (club's) steady state to be in-between 1.6 to 3.4 per cent, whereas the speed of conditional convergence stays in the range of 2.9 to 5.1 per cent; iv) there is no evidence of sigma (σ) convergence, in fact there is a significant increase in the dispersion of the levels of income across the economies under consideration; v) high recourse abundance (within the setting of this club of countries) is associated with high economic growth; vi) high resource abundance within a broader background (including the CEE and CCA, plus OECD countries) is associated with an overall negative impact on economic growth (Sachs and Warner, 1995), however a net negative effect obtains only in countries with poor institutional settings (Mehlum et al, 2006); vii) location matters for growth – the nearer a country happened to be to Berlin or Stockholm (whichever nearer) the higher the rate of economic growth; viii) high quality of governance has a strong positive effect on economic growth, and ix) the higher the educational attainment (proxy for quality of human capital), the higher the real GDP growth.

We explore for a first time the issue of convergence in such a complete (28 former centrally planned economies) setting and report that these countries are expected to reach half the distance to their (unconditional) non-growth steady state in around 50 years, though this may not guarantee catch-up with the industrialised countries. The most promising (time-variant) factors would seem to be the quality of governance and educational attainment (quality of human capital). The effect from enhancing any of these variables would lead to stronger growth and apparently faster convergence to the steady state.

Fourth: Quality of governance and resource "curse" or "blessing"

Why might (transition) countries suffer from the "resource curse". We identify four different channels or transmission mechanisms (with various combinations and variations) which endeavour to account for the inverse statistical relationship between resource abundance and economic growth: i) Decline in terms of trade; ii) Volatility of revenues; iii) Quality of Governance; and, iv) Dutch disease. We provide recommendations for counteractive policy measures in alleviating / preventing the resource "curse", taking into account the concern of political feasibility and avoiding mechanistic approaches to the "resource curse" issues, focusing attention on understanding the subtleties and specificities related to the variety of resource abundant countries and the connected policy lessons.

This is suggestive of an interesting conclusion: some form of the resource "curse" is expected to be observed in any country that extracts natural resource rent. However, a substantial net negative effect would obtain with certainty only in (underdeveloped) countries with poor institutional structures. As a corollary, we suggest reconciliation between the seminal works of both Mehlum et al. (2006) and Sachs and Warner (1995). While their works cover different sets of countries and different time periods, the nexus is unchanged.

Fifth: Salter-Swan model:

We note that the "resource movement effect" as a feature of the Dutch disease is highly relevant for the transition economies in general and those which are resource-abundant in particular. For the process of transition has effectively destroyed the old productive base and a new and private tradable sector is still in the process of establishment.

The model provides a framework for undertaking analysis of the major factors causing structural imbalances and the appropriate application of macro-economic policies in mitigating the dynamics of macro-economic disequilibrium. Despite the conclusions which the model provides, critical

analysis and judgement need to be applied -- as always -- before using it for policy formulation. The factors that should be considered cautiously include: i) prices of tradables and non-tradables may not behave as assumed in the model due to economies of scale in export and import, trade barriers, effects of coincident correction of prices and / or quantities by a group of countries, and imperfect market information; ii) outputs of different economic sectors are neither completely tradable, nor entirely non-tradable, they just have different degrees of tradability; iii) levels of tradability varies over time, on the basis of the degree of price differences; iv) imported goods have a quantity of local value-added ingredient in their final consumer price, and non-tradable goods have some imported components; v) market monopolies in export and import sectors involve particular price formation; to remain competitive an importer may accept a reduction in his monopoly margin and increase the price less than expectations just based on the level of currency appreciation. Then again, an exporter may retain a share of the extra profit incurring from currency devaluation and not pass it on; vi) the setting of the model is comparative static, and does not allow for dynamic adjustment mechanisms or phenomena, such as the alteration of capital and price; and, vii) the analysis is partial equilibrium in another sense: the size of the country is stated to be small, but international repercussions may follow.

Sixth: Balassa-Samuelson hypothesis: After careful theoretical analysis we investigate empirically the B-S effect for Azerbaijan, confirming its validity: i) poorer countries have lower price levels; and, ii) an improvement in productivity in the tradable sector (relative to foreign country) appreciates the exchange rate.

The long-run regression coefficient relating the productivity and the real exchange rate is large (between 0.74 and 0.82 depending on the model selection criteria used) and is strongly significant. Still, the error correction coefficient suggests that the economy's half-life return to equilibrium would take around 3.4 years. This is to say that around 18% of the gap between the long-run values

of the variables is closed every year. Consequently, it would take a long time for the equation to return to its equilibrium once it has been shocked.

As Azerbaijan economic growth (and, it appears, productivity) is largely driven by the value of oil exports our results are a clear sign of Dutch Disease52 -- huge oil revenues cause swift real exchange rate appreciation, leaving the non-oil tradable sector (including manufacturing) unable to compete, consequently its output (as a share of GDP) declines and the country is de facto on the path to deindustrialisation.

Here, we advance the following viewpoints: i) the literature on the "resource curse" provides substantial evidence that natural resource abundance is associated with a range of negative development outcomes, though this evidence is not conclusive; ii) current explanations of the "resource curse" do not sufficiently account for the role of the internal socio-economic forces and the external political and economic background; iii) recommendations for counteractive policy measures in alleviating / preventing the resource curse have not taken genuinely into account the issue of political feasibility; and, iv) academics have been too mechanistic in their approaches to the "resource curse" issues, while the attention needs to be centred on understanding the subtleties and specificities related to the variety of resource abundant countries and the connected policy lessons.

Seventh: What factors narrow or widen the sovereign bond spreads?

Macroeconomic aggregates play a certain role in determining bond spreads, but mostly through the channel of global risk aversion / appetite, corroborating Favero and Missale (2011) for our specific set of (CEE and CCA) countries. The most important variable which appears in both financial market reaction and macroeconomic fundamentals equations and works strongly and consistently in the same direction is VIX. This may suggest that the levels of spreads may be subject to significant alteration by the impact from financial market volatility (as measured by VIX) and could potentially

[52] IMF Country Report No. 14/159, Republic of Azerbaijan, June 2014

be pushed up or down by amounts having little to do with their respective macroeconomic fundamentals.

Understanding all the critical factors that have a significant influence on the variation in spreads is of the upmost importance. If in reality worldwide factors are principally responsible for the time-series alteration, then any kind of government intervention to bring down spreads may prove ineffective, unless strongly determined and unfalteringly pre-coordinated. On the other hand, if the drivers of market spread fluctuations are country specific then such issues should be taken into account in monitoring macroeconomic developments and trying to assess investors' perception of country specific risks.

Eight: We use extensively the Autoregressive Distributed Lags (ARDL) procedure developed by Pesaran and Shin (1995). Our motivation for using this framework allowing for fractionally integrated variables (ARDL) is based on various factors, including: i)the conventional (dichotomous) choice between unit root I(1) and level stationarity I(0) is overly restrictive – many economic time series show signs of being neither I(0) nor I(1); ii) it is a much more general and flexible apparatus than the traditional approach; iii) important for modelling a wide range of macroeconomic relationships; iv) the standard practice of taking first differences may still lead to series with a component of long memory behaviour. Many researchers are accustomed to think in terms of stationarity of any time series used in the construction of whichever econometric model. As the assumption of stationarity is an important one, non-stationary time series are commonly transformed to stationarity by differencing. This would suggest that a model specified in differences of economic time series should be favoured for finding estimates of parameters. But one of the important notions in macroeconomics is the concept of the existence of a long-run equilibrium relationship. Theoretically in steady-state equilibrium economic variables remain unchanged, until the system is shocked. Therefore, if such an equilibrium relationship is specified in first differences, the steady-state differences would be zero and there is no solution.

Conceivably the most-important value added of this thesis is that all features of our analysis are mutually reinforcing, helping to clarify each other and taken together are able to establish the complexity of the transition process in a manner broadly consistent with the facts. This provides a reliable framework for analysis and policy intervention.

Potential major future research areas would include: dynamic interaction of local and international developments; absorbing capacity of transition economies; markets in transition economies; and, the value of manufacturing for transition economies. Hopefully, the international financial institutions would facilitate these promising research areas by taking a more benevolent stance towards the way they distribute their internal datasets.

Annex 1

Table 41: Price Level and Inflation Estimation Equation of Azerbaijan – ADF Unit Root Test

Null Hypothesis: LOG(CPI_AZ) has a unit root
Exogenous: Constant
Lag Length: 3 (Automatic based on SIC, MAXLAG=3)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		**3.123748**	0.9999
Test critical values:	1% level	-4.297073	
	5% level	-3.212696	
	10% level	-2.747676	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 10

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOG(CPI_AZ))
Method: Least Squares
Date: 10/26/10 Time: 16:57
Sample (adjusted): 1999 2008
Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(CPI_AZ(-1))	0.738173	0.236310	3.123748	0.0261
D(LOG(CPI_AZ(-1)))	-0.435879	0.439019	-0.992848	0.3664
D(LOG(CPI_AZ(-2)))	-0.191616	0.372258	-0.514740	0.6287
D(LOG(CPI_AZ(-3)))	-0.652118	0.212931	-3.062579	0.0280
C	-3.493249	1.127837	-3.097299	0.0269

R-squared	0.884884	Mean dependent var	0.057249
Adjusted R-squared	0.792792	S.D. dependent var	0.078581
S.E. of regression	0.035770	Akaike info criterion	-3.516542
Sum squared resid	0.006398	Schwarz criterion	-3.365250
Log likelihood	22.58271	Hannan-Quinn criter.	-3.682510
F-statistic	9.608630	Durbin-Watson stat	1.948433
Prob(F-statistic)	0.014442		

Null Hypothesis: LOG(M2_GDP_AZ_K) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=3)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		**1.009813**	0.9935
Test critical values:	1% level	-4.057910	
	5% level	-3.119910	
	10% level	-2.701103	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 13

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOG(M2_GDP_AZ_K))
Method: Least Squares
Date: 10/26/10 Time: 16:18
Sample (adjusted): 1996 2008
Included observations: 13 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(M2_GDP_AZ_K(-1))	0.159515	0.157965	1.009813	0.3343
C	-0.028566	0.184208	-0.155074	0.8796

R-squared	0.084837	Mean dependent var	0.143228
Adjusted R-squared	0.001641	S.D. dependent var	0.254909
S.E. of regression	0.254700	Akaike info criterion	0.243178
Sum squared resid	0.713593	Schwarz criterion	0.330093
Log likelihood	0.419343	Hannan-Quinn criter.	0.225313
F-statistic	1.019723	Durbin-Watson stat	2.093680
Prob(F-statistic)	0.334282		

Null Hypothesis: CBR_AZ has a unit root

Exogenous: Constant
Lag Length: 3 (Automatic based on SIC, MAXLAG=3)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		**-3.902233**	0.0179
Test critical values:	1% level	-4.297073	
	5% level	-3.212696	
	10% level	-2.747676	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 10

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(CBR_AZ)
Method: Least Squares
Date: 10/26/10 Time: 16:21
Sample (adjusted): 1999 2008
Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CBR_AZ(-1)	-0.605286	0.155113	-3.902233	0.0114
D(CBR_AZ(-1))	0.460210	0.177491	2.592866	0.0487
D(CBR_AZ(-2))	0.733295	0.161248	4.547628	0.0061
D(CBR_AZ(-3))	-0.104556	0.019447	-5.376440	0.0030
C	5.843517	1.470657	3.973406	0.0106

R-squared	0.890445	Mean dependent var	0.050000
Adjusted R-squared	0.802800	S.D. dependent var	2.114106
S.E. of regression	0.938815	Akaike info criterion	3.018456
Sum squared resid	4.406865	Schwarz criterion	3.169748
Log likelihood	-10.09228	Hannan-Quinn criter.	2.852488
F-statistic	10.15975	Durbin-Watson stat	2.740321
Prob(F-statistic)	0.012816		

Table 42: Current Account Balance -- CCA and CIS -- Countries, per cent of GDP

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Armenia	-6.2	-6.8	-0.5	-1	-1.8	-6.4	-11.5	-13.8	-14.6	-12.6	-8.1
Azerbaijan	-12.3	-27.8	-29.8	1.3	17.6	27.3	35.5	23.6	24.1	22.2	21.1
Belarus	-2.3	-2.4	-5.3	1.4	-3.9	-6.7	-8.7	-13.1	-14	-13.9	-9.5
Georgia	-6.4	-9.6	-6.9	-11.1	-15.1	-19.7	-22.7	-11.7	-12	-12.5	-8.9
Kazakhstan	-4.2	-0.9	0.8	-1.8	-2.5	-8.1	4.6	-3.2	3.2	2	2.5
Kyrgyzstan	-4	1.7	4.9	2.8	-3.1	-0.2	-8.1	2.1	-5.4	-9.4	-3.9
Moldova	-1.2	-6.6	-1.8	-7.6	-11.4	-15.3	-16.3	-8.1	-11.2	-11.4	-7.5
Tajikistan	-3.5	-1.3	-3.9	-2.7	-2.8	-8.6	-7.7	-4.9	-3.6	-5.7	-6.6
Turkmenistan	6.7	2.7	0.6	5.1	15.7	15.5	18.7	-16.1	-4.7	3.4	22.7
Ukraine	7.5	5.8	10.6	2.9	-1.5	-3.7	-7.1	-1.5	-0.4	-1.3	-3.2
Uzbekistan	1.2	5.8	7.2	7.7	9.1	7.3	8.7	2.7	3.8	6.3	2
Russia	8.4	8.2	10.1	11.1	9.5	5.9	6.2	4	4.7	3.7	1.3

Source: World Economic Outlook, October 2010; 2010-2012 projections

	2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Armenia	-2.5	-3.9	-8.5	-15.0	-17.6	-14.2	-11.1	-11.1	-8.0
Azerbaijan	1.3	17.7	27.3	33.7	23.0	28.4	26.0	21.8	16.6
Belarus	1.5	-3.8	-6.7	-8.2	-12.5	-15.0	-8.5	-2.9	-10.7
Georgia	-10.8	-15.3	-19.6	-22.0	-10.6	-10.3	-12.7	-11.7	-5.7
Kazakhstan	-1.8	-2.5	-8.0	4.7	-3.6	1.0	5.4	0.5	-0.1
Kyrgyz Republic	-1.5	-10.1	-6.0	-13.9	-4.3	-6.6	-9.6	-25.4	-23.3
Moldova	-7.6	-11.3	-15.2	-16.1	-8.2	-7.5	-11.0	-7.4	-5.0
Tajikistan	-0.8	-0.8	-13.3	0.9	-3.6	-6.6	-2.6	-3.2	..
Turkmenistan	..	..	..	..	..	..	..	..	..
Ukraine	2.9	-1.5	-3.7	-7.1	-1.5	-2.2	-6.3	-8.1	-9.3
Uzbekistan	..	..	..	..	..	..	..	..	..
Russia	11.0	9.3	5.6	6.3	4.1	4.4	5.1	3.5	1.6

Source: Data from database: World Development Indicators; Last Updated: 01/30/2015

Table 43: Ordinary Least Squares Estimates Former USSR – in levels

Dependent variable	INPT	T2	T3	$\overline{R}^2$
AZE	2795.5 (8.1232)	1233.8 (1.2086)	2591.6 (4.5225)	0.22195
BLR	5237.9 (13.3727)	1565.4 (1.3472)	4303.7 (6.5986)	0.38991
EST	8177.1 (14.8078)	1502.4 (0.917161)	7854.9 (8.5424)	0.52437
GEO	5174.5 (17.9217)	295.6059 (0.34513)	-909.2930 ('-1.8025)	0.027415
KAZ	5344.8 (16.3160)	1395.0 (1.4355)	2689.1 (4.6985)	0.24727
KGZ	2925.5 (36.1008)	213.5121 (0.88816)	-563.8195 ('-3.9821)	0.21227
LTU	6402.5 (19.6544)	1112.6 (1.1513)	1935.0 (3.3998)	0.13655
LVA	6935.6 (15.0450)	1131.0 (0.82708)	3649.6 (4.5312)	0.23014
MDA	4653.1 (27.1538)	285.2313 (0.56111)	-1852.1 ('-6.1860)	0.38895
RUS	5840.5 (22.4149)	1203.1 (1.5565)	905.6459 (1.9893)	0.051783
TJK*	2162.8 (21.3387)	-566.3082 ('-2.2810)	-903.0328 ('-4.6529)	0.25650
TKM	2676.1 (20.2103)	599.7619 (1.5269)	422.6458 (1.8268)	0.0042765
UKR	4377.5 (22.9671)	1005.9 (1.7791)	-607.9964 ('-1.8258)	0.088931
UZB	3469.9 (29.9595)	477.7725 (1.3906)	627.1643 (3.0993)	0.11754
USSRF	5116.9 (21.7739)	1049.8 (1.5059)	683.9981 (1.6659)	0.034754

Table 44: Ordinary Least Squares Estimates Former USSR – growth rates

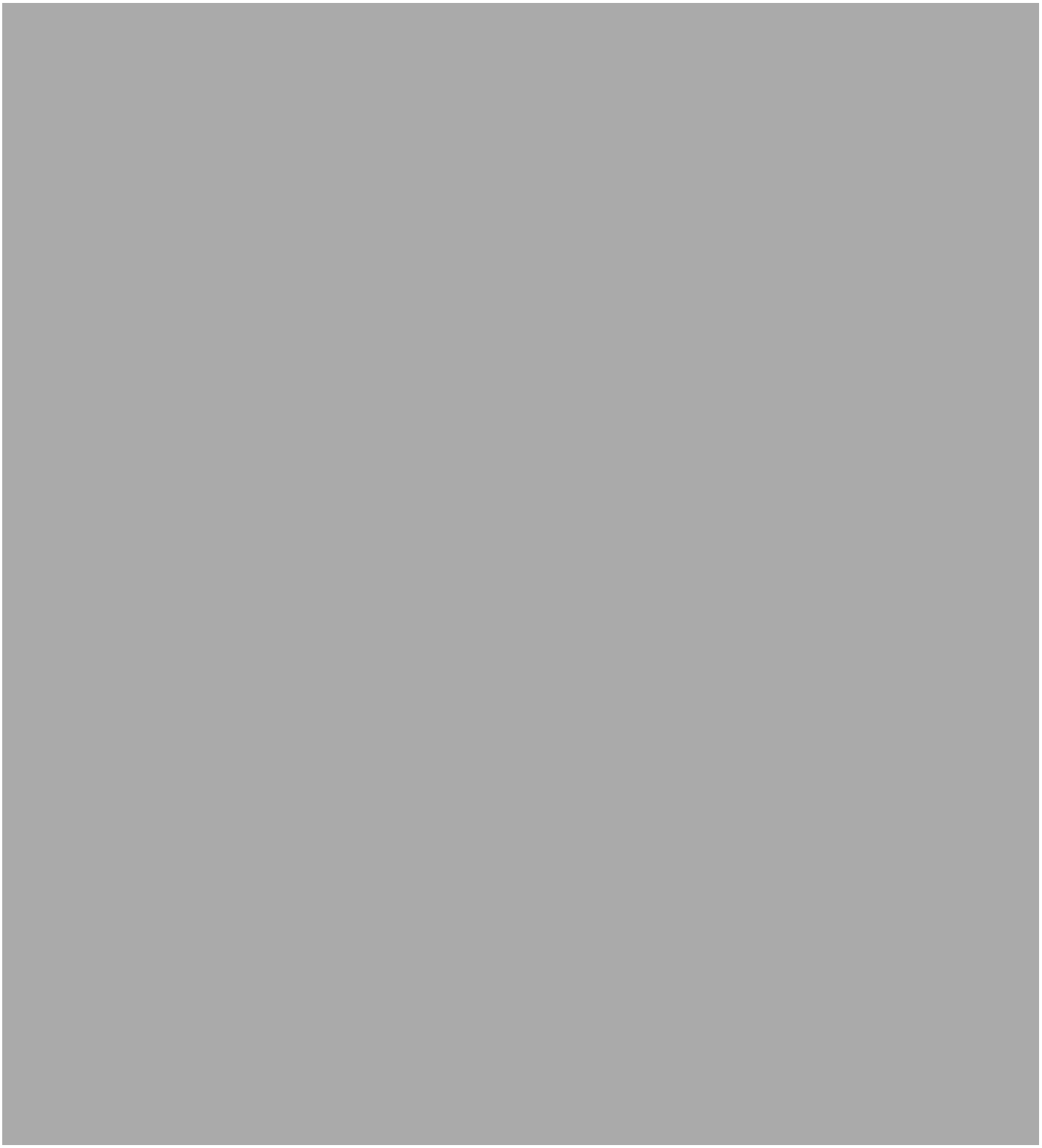
Dependent variable	T1	T2	T3	$\overline{R}^2$
PIAZE	4.8431 (3.5498)	-10.7393 (3.5498)	7.0463 (3.9296)	0.20482
PIBLR	2.6570 (3.5845)	-4.2540 ('-2.0817)	4.6388 (4.7616)	0.17436
PIEST	2.2909 (4.0181)	-5.9908 (-3.8115)	5.0902 (6.7931)	0.37991
PIGEO	3.3864 (3.1526)	-19.1780 ('-6.4764)	5.3100 (3.4955)	0.47652
PIKAZ	2.8176 (3.7233)	-5.6290 ('-2.6982)	4.2812 (4.0004)	0.20891
PIKGZ	1.6315 (2.3278)	-8.1539 ('-4.2202)	1.2720 (1.2833)	0.25696
PILTU	2.5083 (3.5142)	-9.0404 ('-4.5943)	4.4174 (4.3762)	0.36878
PILVA	3.0722 (3.6177)	-11.1195 ('-4.7497)	5.9573 (4.9605)	0.39822
PIMDA	2.3114 (2.2228)	-10.1128 ('-3.5277)	0.53766 (0.36561)	0.19348
PIRUS	2.3536 (3.3087)	-6.0899 ('-3.1055)	2.8847 (2.8676)	0.2073
PITJK	2.8741 (3.6047)	-14.8064 ('-8.4106)	4.4908 (3.4931)	0.60003
PITJKM	2.5483 (2.7016)	-5.3396 ('-2.0534)	3.1525 (2.3633)	0.10339
PIUKR	2.6809 (2.8886)	-7.1020 ('-2.7757)	1.4299 (1.0894)	0.15189
PIUZB	1.6067 (3.2891)	-4.4668 ('-3.3169)	2.6342 (3.8131)	0.25008
PIUSSRF	2.4659 (3.4049)	-6.7195 ('-3.3656)	2.9086 (2.8398)	0.22993

Annex 2

Data availability, accessibility and accuracy

https://www.imf.org/external/pubs/ft/weo/faq.htm#q2b

Frequently Asked Questions, World Economic Outlook (WEO), Last Updated: March 02, 2015



References

Acemoglu D., Johnson S., and Robinson J., 2001. “The colonial origins of comparative development: an empirical investigation.” *The American Economic Review*, Vol. 91, No. 5, pp. 1369-1401, December 2001: American Economic Association

Acemoglu, D., Johnson, S., and Robinson, J., 2003. "An African Success: Botswana." In D. Rodrik (Ed.), *In Search of Prosperity: Analytic Narratives in Economic Growth*. Princeton, Princeton University Press.

Acemoglu, D, Johnson S., and Robinson J. 2005. Institutions as a fundamental cause of long-run growth. In *Handbook of Economic Growth*, ed. P. Aghion, S. Durlauf, 1:385–472. New York: Elsevier

Acemoglu, D., Philippe Aghion, and Fabrizio Zilibotti. 2006. “Distance to Frontier, Selection, and Economic Growth.” Journal of the European Economic Association 4 (1): 37–74.

Akitoby B., and Th., Stratmann, 2006. Fiscal Policy and Financial Markets, IMF Working Paper, January 2006.

Alam, M.S., 1989. “Anatomy of corruption: An approach to the political economy of underdevelopment”, *The American Journal of Economics and Sociology*, Volume 48, 2.

Alesina, A., S. Ozler, N. Roubini, and Ph. Swage, 1996. “Political instability and economic growth.” *Journal of Economic Growth*, 1(2), pp. 189-211.

Alexeev, M. and R. Conrad, 2009. “The Elusive Curse of Oil,” *Review of Economics and Statistics*, 91, No. 3, 586-98.

Alexeev, M. and R. Conrad, 2009b. “The Natural Resource Curse and Economic Transition.” *Economic Systems* 35(4):445–461.

Angrist, J.D. and A.D. Kugler, 2008. Rural windfall or a new resource curse? Coca, income, and civil conflict in Columbia, Review of Economics and Statistics, 90, 2, 191-215.

Annual Report. The Central Bank of Azerbaijan, various issues.

Annual Report. The National Bank of Kazakhstan, various issues.

Annual Report. The National Bank of Kyrgyzstan, various issues.

Amsden, A. H, 2008. The wild ones: industrial policy in the developing world. In *The Washington Consensus Reconsidered: Towards a New Global Governance* Serra, N. and J. Stiglitz (eds). 2008, pp. 95–119.

Arezki, R. and F. van der Ploeg, 2010. Do natural resources depress income per capita?, Review of Development Economics, to appear.

Arezki, R., and F. van der Ploeg, 2007. Can the Natural Resource Curse Be Turned Into a Blessing? The Role of Trade Policies and Institutions., IMF Working Paper, WP/07/55.

Arezki, R., and M., Brückner, 2010. “Resource Windfalls and Emerging Market Sovereign Bond Spreads: The Role of Political Institutions”, International Monetary Fund: Washington, DC.

Arezki, R., Th. Gylfason, and A. Sy (eds.) 2011. Beyond the curse: policies to harness the power of natural resources, Washington, DC: International Monetary Fund, 2011.

Asian Development Bank, 2009. Asian Development Outlook 2009. Mandaluyong City, Philippines: Asian Development Bank, March 2009.

Arora, V. B., and Cerisola, M. B., 2001. "How does U.S. monetary policy influence economic conditions in emerging Markets?" *IMF Staff Papers* 48(3), 474-498.

Auty, R., 2008. “Natural Resources and Development”, in Amitava Krishna Dutt and Jamie Ros (eds.), *International Handbook of Development Economics*, 1; Chletenham UK: Edward Elgar.

Auty, R., 2007. “Patterns of Rent-extraction and Deployment in Developing Countries: Implications for Governance, Economic Policy and Performance”, in Mavrotas, G. & A. Shorrocks (Eds.), Advancing Development: Core Themes in Global Economics, Palgrave, Basingstoke.

Auty, R., 2001. “Why resource endowments can undermine economic development: concepts and case studies”, Paper Prepared for the BP-Amoco Seminar, Lincoln College Oxford University, November 28-29.

Auty, R., 2001a. (ed.) “Resource abundance and economic development”, Oxford: Oxford University Press.

Auty, R. ,1998. “Resource abundance and economic development: improving the performance of resource- rich countries”, The United Nations University World Institute for Development Economics, Helsinki.

Auty, R., 1994. “The resource curse thesis: minerals in Bolivian development, 1970-90” *Singapore Journal of Tropical Geography*, Volume 15, No.2.

Auty, R. ,1994a. “Industrial policy reform in six newly industrialising countries: the resource curse thesis”,*World Development*, Volume 22, No 1.

Auty, R. and Kiiski, S. 2001. “Natural resources, capital accumulation, structural change and welfare”, Chapter 2 in Auty, R., (ed.) *Resource Abundance and Economic Development*, WIDER Studies in Development Economics, Oxford University Press.

Avendano, R., Reisen, H.,and Santiso, J., 2008. The Macro Management of Commodity Booms: Africa and Latin America’s Response To Asian Demand: OECD Development Centre.

Azerbaijan Country Report, 2007. Review of UN Country Team engagement in National Development Strategy / Poverty Reduction Strategy Process. Martin Greeley, Institute of Development Studies, University of Sussex, June 2007.

Bacha, E., M., Holland, and F., Goncalves, 2008. Systemic Risk Dollarization and Interest Rates in Emerging Markets: A Panel-Based Approach, *The World Bank Economci Review*, Vol. 23, No. 1, pp. 101-117

Bacon , R. and Silvana Tordo, 2006. *Experiences with Oil Funds: Institutional and Financial Aspects*. Washington D.C.: The International Bank for Reconstruction and Development/The World Bank.

Baek, In-Mee, A., Bandopadhyaya, and Ch. Du, 2005. "Determinants of market-assessed sovereign risk: Economic fundamentals or market risk appetite?", *Journal of International Money and Finance*, Vol. 24, pp. 533-548.

Balassa, B., 1964. "The Purchasing Power Parity Doctrine: A Reappraisal", *Journal of Political Economy*, vol. 72, December, pp. 584-596

Balassa, B. 1988. "The lessons of East Asian development: an overview, *Economic Development and Cultural Change*, Vol. 36, No. 3

Barro, R., 1991. "Economic growth in a cross section of countries", *Quarterly Journal of Economics*, volume 106, no. 2, May, pp. 407-43.

Barro, R., and X. Sala-i-Martin, 1995. *Economic Growth*, 2nd Ed., Cambridge, Massachusetts, London England: The MIT Pres, 2004.

Baunsgaard, Th., M. Villafuerte, M. Poplawski-Ribeiro, and Ch. Richmond, 2012, "Fiscal Framework for Natural Resource Intensive Developing Countries." *IMF Staff Discussion Note* SDN 12/04.

Baumol, W., 1986. "Productivity Growth, Convergence, and Welfare: What the Long-Run Data Show."*American Economic Review* 75, pp. 1072-85.

Beckmann, J., M. Endrich, and R. Schweichert, 2014. "Government Activity and Economic Growth – One Size Fits All?", *Kiel Working Paper* No. 1903, Kiel Institute for the World Economy

Behrman, J.R., 1987. "Commodity price instability and economic goal attainment in developing countries",*World Development*, Vol.15.

Belhocine N., and S., Dell'Erba, 2013. "The Impact of Debt Sustainability and the Level of Debt on Emerging Markets Spreads", *IMF Working Paper*, No.93, May 2013.

Bellas, D.,M., Papaioannou, and I. Petrova, 2010. "Determinants of Emerging Market Sovereign Bond Spreads: Fundamentals vs Financial Stress", *IMF Working Paper*, December 2010.

Benjamin, N.C., S. Devarajan and R.J. Weiner, 1989. "The "Dutch" disease in a developing country",*Journal of Development Economics*, Volume 30.

Berg, A., and Sachs J., 1992. "Structural Adjustment and International Trade in Eastern Europe: The Case of Poland" In: *Economic Policy*, Jg. 14, S. 117–173

Berlemann M., and Jean-Erik Wesselhoft, 2014. "Estimating Capital Stocks Using the Perpetual Inventory Method – A Surevey of Previous Implementaions and New Empirical Evidence for 103 Countries", *Review of Economics*, 65, Jg. 1-34, Stuttgart.

Bernanke, B. S., 2003. "Friedman's Monetary Framework: Some lessons." Paper presented at the Conference, The Legacy of Milton and Rose Friedman's Free to Choose, organised by the Federal Reserve Bank of Dallas, October 23-24, 203.

Bernanke, B. S., and F. S. Mishkin. 1992. "Central Bank Behavior and the Strategy of Monetary Policy: Observations from Six Industrialized Countries." In Olivier Blanchard and Stanley Fischer, eds., *NBER Macroeconomics Annual*, 1992, 183-238. Cambridge: MIT Press.

Bhagwati, J.N. ,1982. "Directly unproductive, profit seeking (DUP) activities", *Journal of Political Economy*,Vol.90.

Blomstrom, M., and A. Kokko, 2007. "From Natural Resources to High-Tech Production: The Evolution of Industrial Competitiveness in Sweden and Finland", in Lederman, D. and W. Maloney (Eds.), Natural Resources: Neither Curse nor Destiny, The World Bank; Palo Alto: Stanford University Press, Washington DC.

Booth A., 1995. The state and the economy in Indonesia in the nineteenth and twentieth century. In Harris J, J. Hunter, and C.M. Lewis (eds,) *The new institutional economics and third world development.* Routledge, London.

Brohman, J., 1995. Economism and critical silences in the development studies: a theoretical critique of neoliberalism, *Third World Quarterly*, Vol. 16, No. 2

Brohman, J., 1996. Popular Development: Rethinking the Theory and Practice of Development, Blackwell, Oxford

Brahmbhatt, M., O. Canuto and E. Vostroknutova , 2010. Dealing with Dutch disease, Economic Premise 16, World Bank, Washington, D.C.

Birdsall, N., D. Ross, and R. Sabot,.1997. "Education, growth and inequality", In Birdsall, N. and F. Jasperson,, (eds.) *Pathways to Growth: Comparing East Asia and Latin America*, Washington DC: Inter-AmericanDevelopment Bank.

Brunnschweiler, C., 2008.'Cursing the Blessings? Natural Resource Abundance, Institutions, and Economic Growth', World Development, nr 36 (3).

Brunnschweiler, C. and E.H. Bulte, 2008. "The resource curse revisited and revised: a tale of paradoxes and red herrings", *Journal of Environmental Economics and Management*, 55, 3, 248-264.

Brooks, Ch. 2002. *Introductory Econometrics for Finance*, Cambridge University Press

Buiter, W.H. and D.D. Purvis, 1983. "Oil, disinflation, and export competitiveness: A model of the Dutch Disease", 221-248 in J.S. Bhandari and B.H. Putnam (eds.), Economic Interdependence and Flexible Exchange Rates, MIT Press, Cambridge, Mass.

Byrd W. A. 1987. The impact of the two-tier plan/market system in Chinese industry. *Journal of Comparative Economics*, 11:295–308.

Cassel, G., 1918. "Abnormal deviations in international exchanges", The Economic Journal, vol. 28, pp. 413-415.

Calvo, G. and F. Coricelli, 1993. "Output Collapse in Eastern Europe: The Role of Credit", Eichne *International Monetary Fund Staff Papers*, vol. 40, n.1.

Campos, N. F. and F. Coricelli, 2002. "Growth in Transition: What We Know, What We Don't, and What We Should." *Journal of Economic Literature* 40(3), pp.793-836.

Chenery, H. and M. Syrquin, 1975. Patterns of Development, 1950-1970, Oxford University Press, Oxford.

Cherif, R., and F. Hasanov, 2012., "Oil Exporters' Dilemma: How Much to Save and How Much to Invest." *IMF Working Paper* WP/12/4, International Monetary Fund.

Christiano, Lawrence, Martin Eichenbaum, and Sergio Rebelo. 2011. "When is the Government Spending Multiplier Large?" *Journal of Political Economy* 119(1), 78-121.

Chrystal, K. A., 1984. Dutch Disease or Monetarist Medicine? The British Economy under Mrs. Thatcher, Federal Reserve Bank of St. Louis

Coase R. 1992. The institutional structure of production. American Economic Review, 82:713–19

Codogno, L., C., Favero, and A. Missale, 2003. "Yield spreads on EMU government bonds" *Economic Policy*, 2003, vol. 18, issue 37, pages 503-532

Collier, P., F. van der Ploeg, M. Spence, and A. J. Venables, 2010. Managing Resource Revenues in Developing Economies IMF Staff Papers, Vol. 57, No. 1, pp. 84-118, 2010

Collier, P., and B. Goderis, 2007. Commodity Prices, Growth, and the Natural Resource Curse: Reconciling a Conundrum. The Centre for the Study of African Economies Working Paper Series, 274.

Corden, W.M. and J. P. Neary, 1982. "Booming Sector and De-Industrialization in a Small Open Economy," *Economic Journal*, December, Vol. 92, No. 368, pp. 825-48.

Coudert, V. and Gex, M., 2010. Credit default swap and bond markets: which leads the other?, *Banque de France Financial Stability Review - Derivatives, Financial innovation and stability.*

Coudert, V. and Gex, M., 2013. The interactions between the credit default swap and the bond markets in financial turmoil, *Review of International Economics* 21(3): 492-505

Craig, R. S., 2011. "Lessons of Global Financial Crisis for Monetary Policy Frameworks", Paper prepared for SEACEN-CEMLA conference: The Implementation of Monetary Policy: Lessons from the Crisis and Challenges for Coming Years; Malaysia, October 13-14, 2011.

Cuddington, J.T. 1992. "Long-run trends in 26 primary commodity prices: A disaggregated look at the Prebisch-Singer hypothesis." *Journal of Development Economics*, 39, 207-227.

Cuddington, J.T., and C.M. Urzua, 1989. "Trends and cycles in the net barter terms of trade: A new approach." The Economic Journal, 99, 426-442.

Davis G, A., 1999."The minerals sector, sectoral analysis, and economic development", Resources Policy, Volume 24 No 4.

Davis, J., R. Ossowski, J. Daniel, and S. Barnett, 2001. Stabilisation and savings funds for non renewable resources. Occasional Paper 205. International Monetary Fund, Washington DC.

Dechenaux, E., B. Goldfarb, S. A. Shane, and M. C. Thursby, 2003. Appropriability and timing of innovation: Evidence from MIT inventions, NBER Working Paper No. 9735, May 2003.

De Grauwe, P., and Y. Ji, 2012. Self-Fulfilling Crises in the Eurozone: An Empirical Test, CEPS Working Document No. 366/June 2012

Desmet K., M. Breton, I. Ortuno-Ortin, and Sh. Weber, 2011. "The Stability and Breakup of Nations: a Quantitative Analysis", *Journal of Economic Growth, 16:183–213*. Published online 18 August 2011, Springer Science+Business Media, LLC 2011

Devlin J. and M. Lewin, 2002. Issues in oil revenue management. Paper to the World Bank/ESMAP Workshop in Petroleum Revenue Management. Washington DC October 23-24.

Di John, J. 2011. "Is There Really a Resource Curse? A Critical Survey of Theory and Evidence", *Global Governance,* Vol. 17, 2011.

Dodaro, S., 1993. "Exports and Growth: A Reconsideration of Causality", *Journal of Developing Areas,* Vol. 27, No.2, January, 1993

Dritsakis, N. and K. Gialetaki, 2005."Macro-economic Variables Analysis in Ukraine: An Empirical Approach with Cointegration Method." American Journal of Applied Science, 2 (4), pp.836-842.

Duffie, D., 2010a. Credit default swaps on government debt: potential implications of the Greek debt crisis, *Testimony to the United States House of Representatives, Subcommittee on Capital Markets, Insurance, and Government Sponsored Enterprises*

Duffie, D. 2010b. Is there a case for banning short speculation in sovereign bond markets?, *Banque de France Financial Stability Review - Derivatives, Financial innovation and stability* No. 14.

Dwyer G. and Th. Flavin, 2010."Credit Default Swaps on Government Debt: Mindless Speculation?", Notes from the Vaoult, FRB of Atlanta, September 2010.

Ebner, A., 2009. "An empirical analysis on the determinants of CEE government bond spreads", *Emerging Markets Review,* Vol. 10, 2, pp. 97-121.

Edwards, S., 2005. Capital controls, sudden stops and current account reversals. NBER Working Paper 11170. Cambridge, MA.

Egert, B., 2009. "Dutch disease in former Soviet Union: Witch-hunting?", BOFIT Discussion Papers 4.

Eichengreen B., and A. Moody, 1998. "What Explains Changing Spreads on Emerging Markets Debt?" in *Capital Flows and the Emerging Economies: Theory, Evidence and Controversies*, NBER, p. 107-136, University of Chicago Press

Engle, R.F. and C.W.J. Granger, 1987. "Co-integration and Error Correction: representation, Estimation and Testing", *Econometrica*, 55, pp. 251-76.

Esanov, A., M. Raiser and W. Buiter, 2004. "Nature's blessing or nature's curse: the political economy of transition in resource-based economies", Center for Development Research, Bonn, ZEF working paper No. 81

Fardmanesh, M. ,1991. "Dutch disease economics and the oil syndrome: an empirical study", *World Development,* Volume19, No.6.

Favero C., and A., Missale, 2011. "Sovereign Spreads in the Euro Area. Which Prospects for a Eurobond?", *Economic Policy,* Fifty-fourth Panel Meeting Hosted by the National Bank of Poland, Warsaw, 27-28 October 2011

Ferrucci G., 2003. "Empirical determinants of emerging market economies sovereign bond spreads", *Bank of England Working Paper,* No. 205

Foresight, 2013. The Future of Manufacturing: A new era of opportunity and chalnge for the UK, Project Report, The Governmnt Office for Scienec, London

Franke, A., Andrea Gawrich and Gurban Alakbarov, 2009. Kazakhstan and Azerbaijan as Post-Soviet Reinter States: Resource Incomes and Autocracy as a Double "curse" in post-soviet-regimes. *Europe-Asia Studies*, Vol 61-1, pp.109-140, Routledge

Frankel, J. A. 2012. The Natural Resource Curse: A Survey of Diagnoses and Some Prescriptions. In *Commodity Price Volatility and Inclusive Growth in Low-Income Countries*, ed. Rabah Arezki, Catherine Patillo, Marc Quintyn and Min Zhu. Washington D.C.: International Monetary Fund.

Friedman, M., 1994. *Money Mischief*, New York: Harcourt Brace and Company.

Frye, T, and A. Shleifer, 1997. "The Invisible Hand and the Grabbing Hand", *American Economic Review: Papers and Proceedings*, Vol. 87, May 1997, pp. 354-58.

Gahramanov, E. and Liang-Shing Fan, 2002. The "Dutch Disease" in Caspian Region: the Case of Azerbaijan Republic. *Economic Studies*, ColoradoStateUniversity, Vol. 5, No. 10

Gelb, A., 1999. "The End of Transition?" Chapter 2 in Annette Brown (ed.) *When is Transition Over?* Kalamazoo, MI: W.E. Upjohn Institute for Employment Research,1999.

Giorno, C., Richardson, P., Roseveare, D., and van den Noor, P. 1995. "Estimating Potential Output, Output Gaps, and Structural Budget Balances", *OECD Economics Department Working Papers*, no. 152

Granger, C. W. J., 1986. "Developments in the Study of Cointegrated Economic Variables", Oxfrod *Bulletin of Economics and Statistics*, 48, 213-228.

Granger, C. W. J., 1987. "Two Papers: Generalised Integrated Processes and Generalised Cointegration", Working Paper 87-20, University of California at San Diego, Department of Economics.

Grilli, E. R. and M. C. Yang, 1988. 'Primary commodity prices, manufactured goods prices, and the terms of trade of developing countries: What the long run shows'. *The World Bank Economic Review*, 2: 1-47.

Gylfason, T., Herbertson, T.T. and Zoega, G., 1997. "A mixed blessing: Natural resources and economic growth", *Macroeconomic Dynamics*, 3, 204-225, Cambridge University Press

Gylfason T. and Zoega, G., 2006. "Natural resources and economic growth: the role of investment", *World Economy*, vol. 29(8), pp. 1091–115.

Gylfason, T. 2006. *The Dutch Disease: Lessons from Norway*. http://notendur.hi.is/gylfason/Trinidad2006.pdf, accessed on 25 February 2011.

Haber, S. and V. Menaldo., 2010. "Do Natural Resources Fuel Authoritarianism? A Reappraisal of the Resource Curse." *American Political Science Review* 105(1):1–24.

Haberler, G., 1959. International Trade and Economic Develeopment, National Bank of Egypt

Harberger, A., 1954. "Monopoly and Resource Allocation" *The American Economic Revie*w, Vol. 44, No. 2, Papers and Proceedings of the Sixty-sixth Annual Meeting of the American Economic Association, May, 1954, pp. 77-87.

Harding, T. and A.J. Venables, 2010. Exports, imports and foreign exchange windfalls, Oxcarre Research Paper, University of Oxford.

Hare, P., 2002. Industrial Restructuring in European Transition Economies, Experienec to date and Prospects, UNECE Round Table, Geneva, February 12 and 13, 2002.

Hare, P., 2003. Setting the Stage for Stability and Progress in Southeast Europe, KfW Southeast Europe Financial Sector Development Symposium, Berlin, November 13-14, 2003.

Harrison L, Huntington S, eds. 2000. *Culture Matters: How Values Shape Human Progress*. New York: Basic Books

Harrod, R. F, 1933.*International Economics*, London: James Nisbet and Cambridge University Press

Harvey, D.I., N.M. Kellard, J.B. Madsen, and M.E. Wohar, 2010. "The Prebisch-Singer hypothesis: Four centuries of evidence." *The Review of Economics and Statistics*, 92, 367-377.

Hayek, A. 1945. "The Use of Knowledge in Society", *American Economic Review*. XXXV, No. 4. pp. 519-30. American Economic Association, September 1945.

Herb, Michael, 2005, "No Representation without Taxation? Rents, Development and Democracy," Comparative Politics 37, no. 3, 297-317.

Hilscher J., and Y., Nosbusch, 2010. "Determinants of Sovereign Risk: Macroeconomic Fundamentals and the Pricing of Sovereign Debt", *Review of Finance*, Vol. 14 pp. 235-262

Hope K. R., 1998. Development policy and economic performance in Botswana: lessons for the transition economies in sub-Saharan Africa, *Journal of International Development* Volume10.

Humphreys, M., J. Sachs, and J. Stiglitz (eds.). 2007. *Escaping the Resource Curse*, New York: Columbia University Press.

Hausmann, R. and R. Rigobon, 2003. "An Alternative Interpretation of the 'Resource Curse': Theory and Policy Implications," in *Fiscal Policy Formulation and Implementation in Oil-Producing Countries*, edited by J. Davis, International Monetary Fund: Washington, DC, pp. 12-44.

Hausmann R., Rodrik D., Velasco A. 2008. In *The Washington Consensus Reconsidered: Towards a New Global Governance* Serra, N. and J. Stiglitz (eds), 2008, pp. 324–55

Hausmann, R., Hwang, J. and Rodrik, D. 2005. "What You Export Matters." Working paper No. 123. Cambridge, MA: JohnF.Kennedy School of Government, HarvardUniversity.

Hausmann, R. and Klinger, B. 2006. "Structural Transformation and Patterns of Comparative Advantage in the Product Space." Working paper No. 128. Cambridge, MA: Center for International Development, Harvard University.

Henriot, A. (ed.), 2008. "Potential Growth in Europe, How to measure it and how to boost it?" *European Studies* 1, European Economic Network.

Herndon, Th., M., Ash and R., Pollin, 2013. "Does High Public Debt Consistently Stifle Economic Growth? A Critique of Reinhart and Rogoff", Political Economy Research Institute Working Paper Series, University of Massachusetts Amhers, No. 322, April 2013.

Herzer, D., F. Nowak-Lehman, and B. Silverstovs 2006. Export-led Growth in Chile: Assessing the Role of Export Composition in Productivity Growth. *The Developing Economics,* XLIV-3, September 2006, pp. 306-328.

Huang Y. 2008. *Capitalism with Chinese Characteristics: Entrepreneurship and the State*. New York: Cambridge University Press

IMF Country Report, No. 08/214, *Republic of Azerbaijan: 2008 Article IV Consultation—Staff Report; Staff Statement; Public Information Notice on the Executive Board Discussion; and Statement by the Executive Director for Republic of Azerbaijan,* July 2008.

Isham J., Woolcock M., Pritchett L., and Busby, G. 2005. "The Varieties of Resource Experience: Natural Resource Export Structures and the Political Economy of Economic Growth." *The World Bank Economic Review*, Vol. 19, No. 2, pp. 141-174, September, 2005: Oxford University Press

Ismail, K. 2010. "The structural manifestation of the 'Dutch disease': the case of oil-exporting countries", Working Paper 10/103, International Monetary Fund, Washington, D.C.

James, L. S., Gubbins, P., Murray, Ch., and Gakidou, E., 2012. Developing a comprehensive time series of GDP per capita for 210 countries from 1950 to 2015. *Population Health Metrics* 2012, 10:12 http://www.pophealthmetrics.com/content/10/1/12

Jaramilo, L., and A., Weber, 2013. "Global Spillovers into Domestic Bond Markets in Emerging Market Economies", IMF Working Paper, No. 264, Novemebr, 2013.

Johansen, S. 1988. "Statistical Analysis of Cointegrated Vectors", *Journal of Economic Dynamics and Control*, 12, pp. 231-54.

Johnson, C. 1982. *MITI and the Japanese Economic Miracle*. Stanford, CA: Stanford University Press

Kaldor, M., Karl, T.L. and Y. Said, 2007. *Oil Wars*, Kaldor, M., T.L. Karl and Y. Said (eds.), Pluto Press

Kaldor, N. ,1967. *Strategic Factors in Economic Development*, New York State School of Industrial and Labour Relations, Cornell University, Ithaca, NY.

Kamin, S., and K., von Kleist, 1999. "The Evolution and Determinans of Emerging Markets Credit Spreads in the 1990s.", Boards of Governors of the Federal Reserve System, International Finance Discussion Paper, No. 653, November 1999.

Keynes, J. M., 1936. *The General Theory of Employment, Interest and Money*, Macmillan.

Kim, T.H., S. Pfaffenzeller, T. Rayner, and P. Newbold, 2003. "Testing for linear trend with application to relative primary commodity prices." Journal of Time Series Analysis, 24, 539-551.

Kindleberger, Ch. 1956. *Terms of trade: a European case study*, Wiley, New York.

Kindleberger, Ch. 1958. 'The terms of trade and economic development'. *Review of Economics and Statistics*, 40: 72-85.

Klepsch C., and T. Wollmershauser, 2011. “Yield spreads on EMU government bonds: How the financial crisis has helped investors to rediscover risk” *Intereconomics*, ISSN 1613-964X, Springer, Heidelberg, Vol. 46, Iss. 3, pp. 169-176

Krugman, P., 1987. “The narrow moving band, the Dutch disease and the competitive consequences of Mrs. Thatcher: Notes on trade in the presence of dynamic scale economies”, *Journal of Development Economics*, Volume 27.

Krugman, P., 1998. "It's baack: Japan's Slump and the Return of the Liquidity Trap”, *Brookings papers on economic activity*, Vol 2, 1998.

Kolodko G. W. 2000. *From Shock to Therapy: Political Economy of Postsocialist Transformation*. New York: Oxford University Press

Konte, M., 2012. “A curse or a blessing? Natural resources in a multiple growth regimes analysis.” *Applied Economics* 45:26, 3760-3769

Kornai, J., 1990. *The Road to a Free Economy: Shifting from a Socialist System*. New York: Norton

Kornai, J., 1999. “Reforming the Welfare State in Postsocialist Economies,” Chapter 6 in Annette Brown (ed.) *When is Transition Over*? Kalamazoo, MI: W.E. Upjohn Institute for Employment Research, 1999.

Lal, D., 1995. “Why growth rates differ”, In Koo, B.H. and D.H., Perkins, (eds). *Social Capability and Long Term Economic Growth*, Macmillan, New York.

Larsen, E., 2003. Are Rich Countries Immune to the Resource Curse? Evidence from Norway’s Management of its Oil Riches. Discussion Paper No. 362, October 2003: Statistics Norway.

Larsen, E. R. 2006. “Escaping the resource curse and the Dutch disease: When and why Norway caught up with and forged ahead of its neighbours.” *American Journal of Economics and Sociology*, Vol. 65, No. 3, pp. 605-640.

Lederman, D and Maloney, W.F. 2003. Trade Structure and Growth. World Bank Policy Research Working Paper 3025, World Bank, Washington DC.

Lederman, D., and W. F. Maloney, eds. 2007. *Natural Resources: Neither Curse nor Destiny.* Washington, DC: World Bank.

Lewin, M. 2011. “Botswana’s Success: Good Governance, Good Policies, and Good Luck” in *Yes, Africa Can: Success Stories From a Dynamic Continent*, Chuhan-Pole P., and M. Angwafo (eds.), the World Bank, Washington DC, 2011.

Li, Shuhe and Lian, Peng 1999. “Decentralization and coordination: China’scredible commitment to preserve the market under authoritarianism”, China Economic Review, vol. 10, No. 2.

Lin, J.Y. 2007. *Development and Transition: Idea, Strategy, and Viability*. Draft Pap. Marshall Lect., Cambridge University, UK

Lipton, D., Sachs, J., 1990a. “Creating a market economy: the case of Poland”. Brookings Papers on Economic Activity 1990, 1, 75-147.

Lipton, D., Sachs, J., 1990b. “Privatization in Eastern Europe: the case of Poland”. Brookings Papers on Economic Activity 1990, 2, 293-341.

Manion M. 2004. *Corruption by Design: Building Clean Government in Mainland China and Hong Kong*. Cambridge, MA: HarvardUniv. Press

Matsen, E., and Torvik, R., 2005."Optimal Dutch Disease", *Journal of Development Economics*, 78, 494–515.

Matsuyama, K. ,1992. "Agricultural productivity, comparative advantage and economic growth", *Journal ofEconomic Theory*, 58, pp. 317-334.

MacDonald, R. and Ricci, L. 2001."PPP and the Balassa Samuelson Effect: The Role of the Distribution Sector", IMF Working Paper, WP/01/38

MacDonald, R. and Ricci, L. 2002."Purchasing Power Parity and New Trade Theory", IMF Working Paper, WP/02/32

Mbaku, J. M., 1992. 'Bureaucratic Corruption as Rent-Seeking Behaviour', *Konjunkturpolitik* (Germany), Volume. 38, No. 4, pp. 247–65.

McGuire, P., and M. Schrijvers, 2003. Common factors in emerging market spreads, *BIS Quarterly Review* , December 2003

McMahon, G., 1997. "The Natural Resource Curse: Myth or Reality?" mimeo, World Bank Institute.

Mehlum H., K. Moene and R. Torvik, 2006. Institutions and the resource curse. *Economic Journal*, Volume 116, January, pp.1–20.

Mehrara, M., Alhosseini, S., and Bahramirad, D. 2008. Resource curse and institutional quality in oil countries. MPRA Paper No. 16456. July 2008.

Mikesell, R., 1997. "Explaining the resource curse, with special reference to mineral-exporting countries."*Resources Policy*, Volume 23, No. 4.

Min, H., 1998. "Determinants of Emerging Market Bond Spreads, Do Economic Fundamentals Matter?", *Policy Research Working Paper*, The World Bank Development Research Group, March 1998.

Mody, A., 2009. "From Bear Stearns to Anglo Irish: How Eurozone Sovereign Spreads Related to Financial Sector Vulnarability" IMF Working Paper, No. 108, May 2009.

Moreno. R. and Rh. Trehan, 1997. "Location and the Growth of Nations." *Journal of Economic Growth, 2: 399–418, December 1997.* Kluwer Academic Publishers, Boston

Morshed, A.K.M. and S.J. Turnovsky, 2004. Sectoral adjustment costs and real exchange rate dynamics in a two-sector dependent economy, *Journal of International Economics*, 62, 147-177.

Montinola, G., Yingyi Q. and B. R. Weingast, 1995. "Federalism, Chinese Style: The Political Basis for Economic Success in China", World Politics 48, 50–81.

Murphy, K., and Shleifer A, Vishny RW. 1992. The transition to a market economy: pitfalls of partial reform. *Quarterly Journal of Economics 26:618*–34.

Musso A. and Th. Westermann, 2005. Assessing Potential Output Growth in Euro Area, a Growth Accounting Perspective, ECB Occasional Paper, No. 22, January 2005.

National Bank of the Kyrgyz Republic, Balance of Payments of the Kyrgyz Republic, various issues.

Naughton B. 2007. *The Chinese Economy: Transitions and Growth*. Cambridge, MA: MIT Press

Ng, S. and Perron, P. 2001."Lag Length Selection and the Construction of Unit Root Tests with Good Size and Power", *Econometrica*, vol. 69, pp. 1519-1554

Niskanen, W.A., 1971. Bureaucracy and representative government. Chicago: Aldine Atherton.

Noland M, Pack H. 2003. *Industrial Policy in an Era of Globalization: Lessons from Asia*. Washington, DC: Inst. Int. Econ.

North D. 1990. *Institutions, Institutional Change, and Economic Performance*. New York: Cambridge Univ. Press

Obstfeld M., and K. Rogoff, 1996. *Foundations of International Macroeconomics*, MIT.

O'Kane, D., 2012. The link between eurozone sovereign debt and CDS prices, Banks, Markets and Investors 117.

Okruhlik**,** G.,1999**, "**Rentier Wealth**,** Unruly Law and the Rise of Opposition: The Political Economy of Oil States**,"** Comparative Politics,Volume 31, No. 3, pp. 295-315

Owen, A., Videras, J. and Davis, L. 2009. Do all countries follow the same growth process?, *Journal of Economic Growth*, 14, 265–86.

Pagano, M., and L-W von Thadden, 2004. "The European bond markets under EMU", *Oxford Review of Economic Policy*, Vol. 20, No. 4

Palladini, G. and Portes, R., 2011. Sovereign CDS and Bond Pricing Dynamics in the Euro-Area, NBER Working Paper 17586, November 2011.

Papyrakis, E., and Gerlagh, R. 2004. The resource curse hypothesis and its transmission channels, *Journal of Comparative Economics*, Vol. 32, 1, 2004, pp. 181–193.

Persson, A. and T. Terasvirta 2003. "The net barter terms of trade: A smooth transition approach." International Journal of Finance & Economics, 8, 81-97.

Pesaran, M. H. and B. Pesaran 1997. *Working with Microfit 4.0, Interactive Econometric Analysis*, Oxford University Press.

Pesaran, M. H. and Y. Shin, 1995. "An Autoregressive Distributed Lag Modelling Approach to Cointegration Analysis", *DAE Working Paper* No.9514, Department of Applied Economics, University of Cambridge.

Pesaran, M. H., Y. Shin and R. J. Smith, 1996. "Testing for the Existence of Long-Run Relationship", DAE Working Paper No. 9622, Department of Applied Economics, University of Cambridge.

Pesaran, M. H., Y. Shin and R. J. Smith 2001. "Bounds testing approaches to the analysis of level relationships", Journal of Applied Econometrics, special issue in honour of J. D. Sargan on the theme "Studies in Empirical Macroeconometrics", D.F. Hendry and M.H. Pesaran (eds),Vol.16,pp.289–326.

Petersen, Ch., and N. Budina. 2003. *Governance Framework of Oil Funds: The Case of Azerbaijan and Kazakhstan*. Washington D.C.: World Bank.

Perkins, D.H. and M. Syrquin, 1989. "Large countries: the influence of size", In Chapter 32, Chenery, H. and T.N. Srinivasan, (eds.), *Handbook of Development Economics*, VolumeII, North Holland, Amsterdam.

Pindyck, R., 1999. "The long run evolution of energy prices", *The Energy Journal*, Volume 20, No.2

Ploeg, F. v. d., and Poelhekke, S., 2008. Volatility, Financial Development and the Natural Resource Curse. Oxcarre Research Paper, 2008-03, University of Oxford.

Polterovich,V.,V. Popov, and A. Tonis, 2010. Resource abundance: A curse or blessing?, DESA Working Paper, No.93.

Portes, R., 1991. "The Path of Reform in Central and Eastern Europe: An Introduction," *CEPR Discussion Papers* 559, C.E.P.R. Discussion Papers.

Portes, R., 2010. Ban Naked CDS, Euro Intelligence.

Powers, W. and D. Riker, 2013. "The Exchange Rate Pass-through in Global Value Chains: The Effects of Upstream Suppliers", Office of Economics Working Paper, No. 2013-02B, US International Trade Commission

Prebisch, Raul, 1950. The Economic Development of Latin America and Its Principal Problems, New York.

Qian Y. and G. Roland, 1999."Federalism and the Soft Budget Constraint", American Economic Review, Vol. 88, No. 5, 1998

Quah, D., 1995. "Empirics for Economic Growth and Convergence", *Center for Economic Performance Discussion Paper*, No. 253, July 1995

Ramey, G. and V.A. Ramey, 1995. "Cross-country evidence on the link between volatility and growth," *American Economic Review*, vol. 85, pp. 1138–1151.

Rasiah R. and I. Shari, 2001. Market, government and Malaysia's new economic policy. *Cambridge Journal of Economics*, Volume 25, No 1.

Reinhart C., and K. Rogoff, 2010. "Growth in a Time of Debt", *American Economic Review: Papers & Proceedings 1*00, May 2010, pp. 573–578

Richmond Ch., I. Yackovlev, and Shu-Chun S. Yang, 2013. "Investing Volatile Oil Revenues in Capital-Scarce Economies: An Application to Angola," *IMF Working Papers* 13/147, International Monetary Fund

Rodrik, D., 2004. "Industrial Policy for the Twenty-First Century," Working Paper Series 04-047, Harvard University, John F. Kennedy School of Government.

Rodrik, D. 2007. *One Economics, Many Recipes*. Princeton, NJ: PrincetonUniversity Press

Rodrik, D. 2008. A practical approach to formulating growth strategies. In *The Washington Consensus Reconsidered: Towards a New Global Governance,* Serra, N. and J. Stiglitz (eds). 2008, pp. 356–82

Rodrik, D. 2008. "Normalizing Industrial Policy," Commission on Growth and Development Working Paper No. 3, Washington, DC, 2008.

Rodrik, D. 2011. “The Future of Convergence.” HKS Faculty Research Working Paper Series RWP11-033, John F. Kennedy School of Government, Harvard University.

Rosenberg, Ch. And Tapio O. Saavalainen, 1998. Dealing with Azerbaijan’s Oil Boom., Finance and Development, September 1998, Vol. 35, Number 3.

Ross, M., 2001, “Does Oil Hinder Democracy?” *World Politics* 53, no.3, 325-61.

Ross, M., 2006, “A Closer Look at Oil, Diamonds, and Civil War,” Annual *Review of Political Science* 9, 265-300.

Ross, M., 2014. "What have we learned about the resource curse?" Working paper

Rybczynski, T.M., 1955. Factor endowment and relative commodity prices. *Economica* 22 (88), 336-41

Sachs, Jeffrey, 2007. “How to Handle the Macroeconomics of Oil Wealth,” Ch. 7 in *Escaping the Resource Curse,* edited by M.Humphreys, J.Sachs and J.Stiglitz (Columbia University Press: NY), pp.173-193.

Sachs, J.D. and A.M. Warner, 1995a. “Natural resource abundance and economic growth”, NBER Working Paper, No.5398.

Sachs, J.D. and A.M. Warner, 1995. “Economic convergence and economic policy”, Working Paper, No.5039, National Bureau of Economic Research, Cambridge MA.

Sachs, J.D. and Warner, A.M. 1997. “Natural resource abundance and economic growth”, Center forInternational Development and Harvard Institute for International Development, Harvard University, Cambridge MA.

Sachs, J.D. and A. M. Warner, 1999. “The big push, natural resource booms and growth”, *Journal of Development Economics,* Vol.59.

Sachs, J.D. and A.M. Warner, 2001. “The Curse of Natural Resources,” European Economic Review (Elsevier), vol. 45(4-6), pages 827-838, May.

Sarraf, M. and M. Jiwanji, 2001. “Beating the resource curse: the case of Botswana”, Environmental Economics Series, Paper No.83.

Sala-I-Martin, X., and A. Subramanian, 2003, “Addressing the Natural Resource Curse: An Illustration from Nigeria.” IMF Working Paper WP/03/139.

Salter, W., 1959. “Internal and External Balance: The Role of Price and Expenditure Effects”, *Economic Record*, 35 (August), pp. 226-38.

Samuelson, P., 1964. ”Theoretical Notes on Trade Problems”, *Review of Economics and Statistics*, vol. 23, pp.: 1-60.

Sappington, D. E.M., and Joseph E. Stiglitz. 1987. “Privatization, Information, and Incentives.” Journal of Policy Analysis and Management, 6(4): pp. 567-579.

Schumpeter, J. 1942. *Capitalism, Socialism, and Democracy*, New York: Harper.

Shim I, and H. Zhu, 2010.The Impact of CDS Trading on the Bond Market: Evidence from Asia, *BIS Working Paper No. 332*, November 2010

Singer, H. W., 1950. “US Foreign Investment in Underdeveloped Areas: The Distribution of Gains between Investing and Borrowing Countries,” *American Economic Review, Papers and Proceedings*, 40, May: 473-485.

Singer, H. W., 1998. "Beyond Terms of Trade: Convergence/Divergence and Creative/Uncreative Destruction", Zagreb International Review of Economics and Business, Vol. 1, No. 1, pp 13-25: Economics Faculty Zagreb.

Statistics Bulletin. The Central Bank of Azerbaijan. Various issues.

Stevens, P. 2003. “Resource Impact: a Curse or a Blessing? -- A Literature Survey", Online Journal CEPMLP. June 2003. Accessed on 10 February, 2011.

Stijns, J.C., 2001. “Natural resource abundance and economic growth revisited”, University of California at Berkeley.

Stiglitz, J., J. Lin, and C. Monga, 2013. The Rejuvenation of Industrial Policy, Policy Research Working Paper, 6628, The World Bank

Stolper, W. and P.A. Samuelson, 1947. “Protection and Real Wages”, *Review of Economic Studies* , 9.

Spolaore, E., and R Wacziarg, 2013. “How Deep Are the Roots of Economic Development?” *Journal of Economic Literature* 2013, 51(2), pp. 325-369.

Subrahmanyam, M. G., Tang, D. Y. and Wang, S. Q., 2012. “ Does the tail wag the dog? The effect of credit default swaps on credit risk”, *HKIMR Working Paper* No.29/2012

Svejnar J., 2001. “Transition Economies: Performance and Challenges”, William Davidson Institute Working Paper No. 415, December 2001

Swan, T., 1960. “Economic Control in a Dependent Economy”, *Economic Record*, 36, pp. 51-66.

Torvik, R., 2009. “Why do some resource-abundant countries succeed while others do not?” *Oxford Review of Economic Policy*, Volume 25, Number 2, pp.241–256.

Torvik, R., 2001. “Learning by doing and the Dutch disease”, *European Economic Review*, Volume 45.

Ulfelder, Jay, 2007. “Natural Resource Wealth and the Survival of Autocracies,” *Comparative Political Studies* 40, 8, 995-1018.

U.S. Energy Information Administration Statistics, www.eia.doe.gov

Usui, N., 1997. “Dutch disease and policy adjustments to the oil boom: a comparative study of Indonesia and Mexico”, *Resources Policy*, Volume 23, No. 4, 1997, pp. 151-162.

Van Wijnbergen, S.,1984b. “Inflation, unemployment and the Dutch disease in oil-exporting countries: Ashort-run dis-equilibrium analysis”, *Quarterly Journal of Economics*, Volume 99, May.33

Verdoorn, J. P. 1949. “On the Factors Determining the Growth of Labor Productivity,” in L. Pasinetti (ed.), Italian Economic Papers, Vol. II, Oxford: Oxford University Press, 1993.

Viner, J. 1952. International Trade and Economic Development. Oxford: Oxford University Press.

Wade R. 1990. *Governing the Market: Economic Theory and the Role of Government in East Asian Industrialization*. Princeton, NJ: Princeton University Press.

Walder, A. G. 1995. “Local Governments as Industrial Firms: An Organizational Analysis of China’s Transitional Economy.” *American Journal of Sociology* 101, 263-301.

White, G. and R. Wade, 1988. 'Developing States and Markets in East Asia: An introduction", in White, G. (ed.) *Development States in East Asia,* London: the Macmillan Press.

Woo WT., 1999. "The real reasons for China's growth." *China Journal* 41:115–38.

World Bank, 1998. *Public Expenditure Management Handbook,* The World Bank, Washington, D.C., June 1998

Wright, G., and J. Czelusta, 2004. Why economies slow: the myth of the resource curse. *Challenge* 47, 2, pp. 6-38.

Wright, G., and J. Czelusta, 2007. 'Resource-Based Growth: Past and Present', in Daniel Lederman and William F. Maloney (Eds.), Natural Resources: Neither Curse nor Destiny, The World Bank and Stanford University Press, Washington DC & Palo Alto.

Wright, J., E. Frantz, and B. Geddes., 2014. "Oil and Autocratic Regime Survival." *British Journal of Political Science* pp. 1–20

Younger, S.D., 1992. "Aid and the Dutch disease: macroeconomic management when everybody loves you", World Development, Volume.20, Number11.