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1 October 2015

Online at <https://mpra.ub.uni-muenchen.de/67013/>  
MPRA Paper No. 67013, posted 03 Oct 2015 05:44 UTC

## What Uzbekistan tells us about industrial policy that we did not know?

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### ABSTRACT

This paper discusses Uzbekistan's recent experience with structural shifts and industrial policy, with a particular focus on various industry policy instruments, and its implications for the existing theories of industrial policy. In particular, two major hypotheses are discussed: (1) the hypothesis of Hausmann, Hwang and Rodrik (the more technologically sophisticated the export structure, the better for growth) and (2) the hypothesis of Justin Yifu Lin (export specialization should build on existing comparative advantages and should not jump over the necessary technological stages).

**Keywords:** Uzbekistan, economic growth, **economic diversification**, industrial policy, **exchange rate policy**, **wages policy**

**JEL classification:** O14, O25, O4, O53

## What Uzbekistan tells us about industrial policy that we did not know?

Vladimir Popov

Anis Chowdhury<sup>1</sup>

### I. Introduction

Uzbekistan in recent 10 years has been an extremely successful economy – high growth (8%), low unemployment and reasonable macro-economic stability, low domestic and international debt, relatively low inequality. Even more impressive are the structural shifts that happened in recent 25 years after Uzbekistan became independent:

- (1) decrease in production and export of cotton (that was previously a mono culture), increase in food production and achievement of self-sufficiency in food,
- (2) achievement of self-sufficiency in energy and becoming a net fuel exporter;
- (3) increase in the share of industry in GDP and the share of machinery and equipment in industrial output and export (a competitive export oriented auto industry was created from scratch). In recent years Uzbekistan promotes heavy chemical industries (production of synthetic fuel and polypropylene goods from natural gas). This is the next stage of industrial policy after reaching food and energy self-sufficiency and successful auto industry development.

This paper argues that Uzbekistan’s development achievements, even though not as spectacular as that of China, have been due to deliberate government policies rather than the result of just market reforms that brought about growth conforming with its factor endowment and/or natural comparative advantage. The paper acknowledges that Uzbekistan enjoyed favourable external environment, but attributes its rapid growth to reasonable macroeconomic stability and industrial policies. It begins with a brief discussion of industry policy and economic diversification in the post-Soviet States in Central Asia and Eastern Europe, including Russia. The rest of the paper is organized as follows: Section III compares Uzbekistan’s transition and economic performance vis-à-vis other post-Soviet States; Section IV discusses changes in the economic structure of Uzbekistan; Section V shows that the main instrument of Uzbekistan’s industrial policy has been under-valuation of the exchange rate; Section VI reflects on the issues of industrial upgrading - the dilemma of choosing “winning” industries in the context of general debate about the nature of industrial policy, especially the hypothesis advanced by Haussmann,

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<sup>1</sup> The paper reflects the views of the authors and not of the organizations with which the author are affiliated.

Hwang and Rodrik vis-à-vis that by Justin Yifu Lin; Section VII contains concluding remarks on lessons from Uzbekistan's industrial policies and what Uzbekistan can learn from the experience of successful East Asian countries, especially Singapore in its attempt to upgrade its industrial structure.

## **II. Industrial policy and economic diversification**

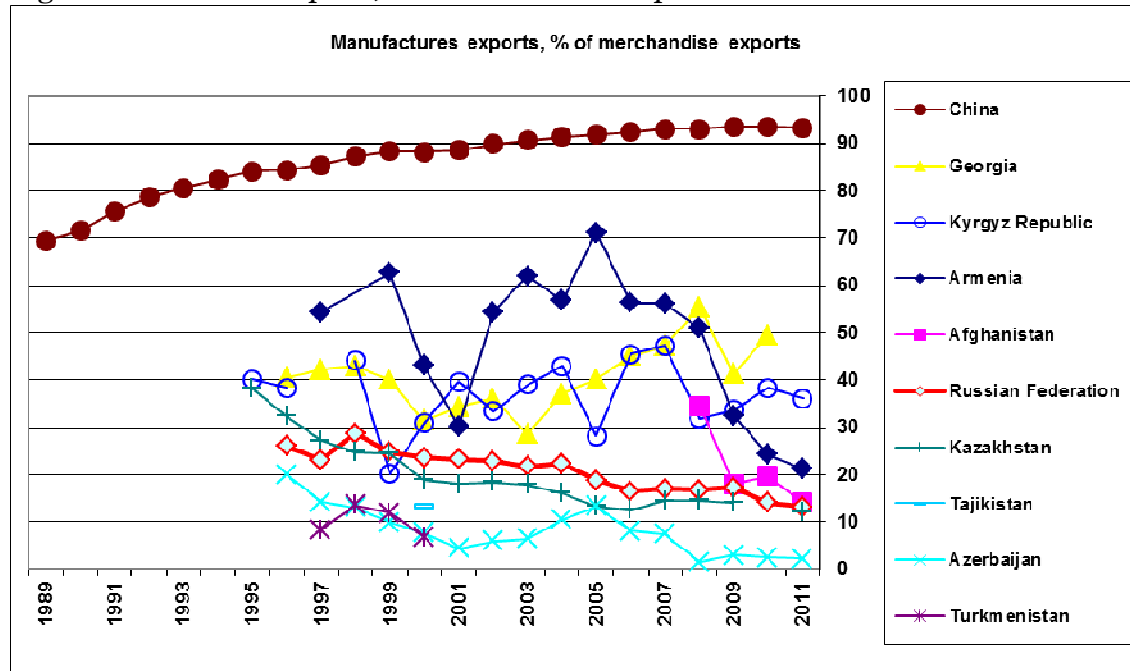
Industrial structure matters for economic development. The Chenery (1960) hypothesis was that countries at the similar level of economic development should have similar patterns of allocation of resources between sectors. But in theoretical models it is often assumed that there are externalities from industrialization and industrial export (Murphy, Shleifer & Vishny, 1989; Polterovich & Popov, 2004, 2005). And there is growing evidence that more industrialized countries and countries with more technologically sophisticated industrial export are growing faster than others (Hausmann, Hwang & Rodrik, 2006; Rodrik, 2006).

Not all countries are able to climb the technological ladder and to diversify and upgrade the structure of their economies and exports. In most transition economies there occurred a primitivization of the industrial structure as secondary manufacturing and high tech industries proved to be uncompetitive after deregulation of prices and opening up of the economy and hence curtailed their output. As a matter of fact, the increase in the share of service sector, especially trade and finance, at the expense of industry (deindustrialization) occurred in all post-communist economies (previously in the centrally planned economies the service sector, in particular trade and finance, were underdeveloped). However, it seems that in many of these economies deindustrialization went too far. In Tajikistan, for instance, the share of services in GDP nearly doubled – increased from about 30% in the beginning of the 1990s to 57% in 2010 (WDI), whereas the share of manufacturing in GDP fell from 25% in 1990 to 10% in 2010. In Russia the share of industry in GDP fell from about one half in 1990 to about one third in the 1990s, whereas in industry itself the share of primary sector (fuel, energy, steel and non-ferrous metals) in total industrial output increased from 25% to over 50%.

The structure of exports in most post-Soviet states also became more primitive in recent two decades – the share of manufactured goods in total exports either declined or did not show any clear tendency towards increase (fig. 1). Partly it was caused by the increase in resource prices and resource boom – expansion of fuel production and exports in Azerbaijan, Kazakhstan, Russia, and Turkmenistan. In Russia the share of fuel, minerals, metals and diamonds in total

export grew from 52% in 1990 (USSR) to 67% in 1995 and to 81% in 2012, whereas the share of machinery and equipment fell from 18% in 1990 (USSR) to 10% in 1995 and to 4.5% in 2012.

**Fig. 1. Manufactures exports, % of merchandise export**



Source: WDI.

These changes in industrial structure were not the result of “invisible hand of the market” alone. As Greenwald and Stiglitz (1986, 2013) state, market failures are pervasive, private rewards and social rewards virtually always differ, so governments are inevitably involved in shaping the industrial structure of the economy, both by what they do and by what they do not do. As many authors point out, the secret of “good” industrial policy in East Asia, as opposed to “bad” industrial policy in the former Soviet Union, Latin America and Africa may be associated with the ability to reap the benefits of export externalities (Khan, 2007; Gibbs, 2007). Exporting to world markets, especially to developed countries, enables the upgrading of quality and technology standards and yields social returns in excess of returns to particular exporters. The greatest increases in productivity are registered at companies that export to advanced (Western) markets and that export hi-tech goods (Harris & Li, 2007; Shevtsova, 2012). It has been also shown that the gap between the actual level of development and the hypothetical level that corresponds to the degree of sophistication of a country’s exports is strongly correlated with productivity growth rates (Hausmann et al., 2006). To put it differently, it pays off to promote

exports of sophisticated and high tech goods. Not all the countries that try to promote such exports succeed, but those that do not try, virtually never engineer growth miracles.<sup>2</sup>

It should be noted though that there is an opposite view – for instance, in the recent paper from the World Bank (Gill, Izvorski, van Eeghen & De Rosa, 2014). It concludes that it is not clear whether diversifying exports and production is necessary for development and that governments need worry less about the composition of exports and the profile of production and more about national asset portfolios—the blend of natural resources, built capital, and economic institutions.

### **III. Uzbekistan's transition and economic performance**

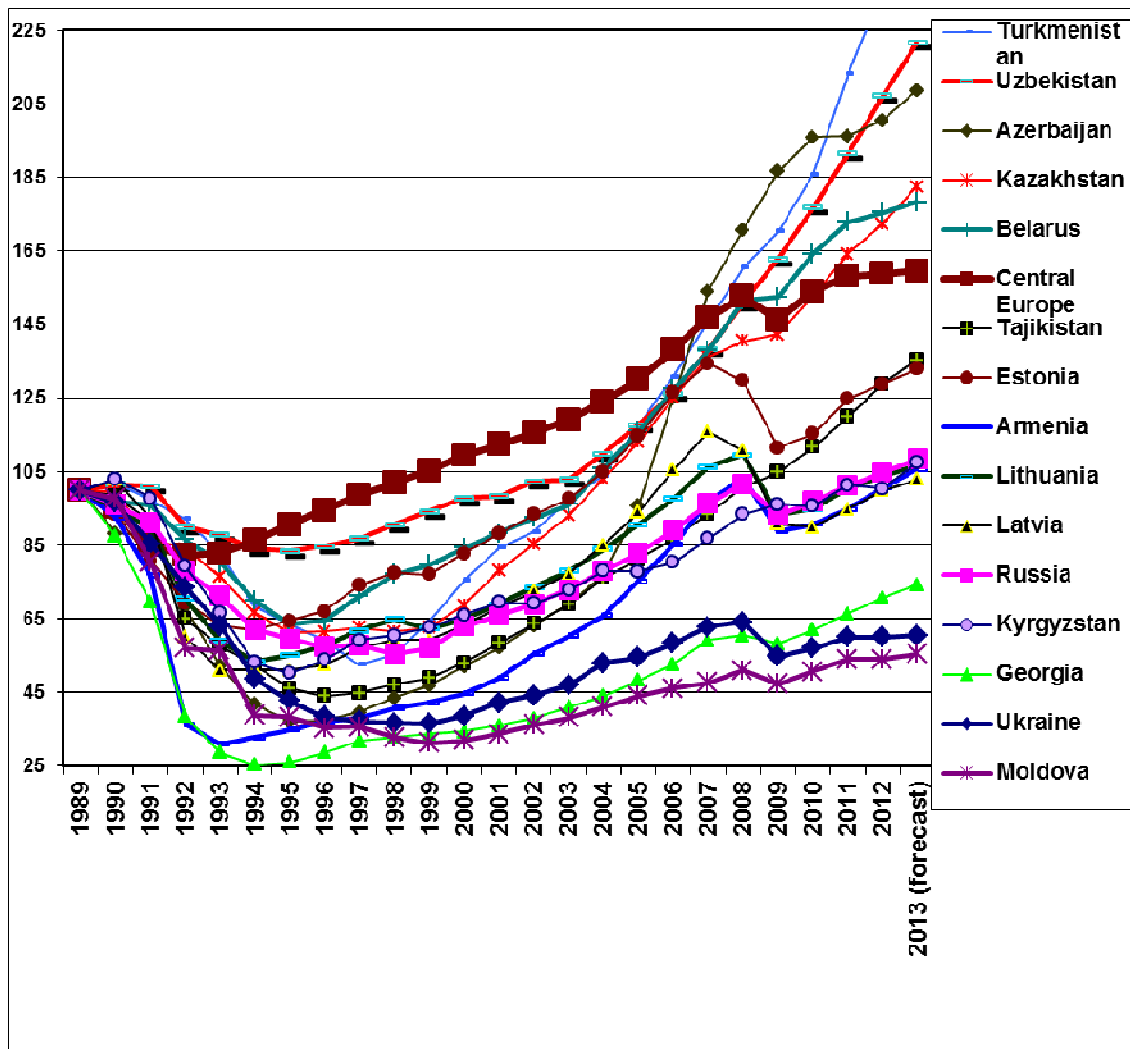
After the collapse of the USSR and market oriented reforms in successor states the comparative performance in the post-Soviet space varied greatly (fig.2). In retrospect, it is obvious that rapid economic liberalization did not pay off: many gradual reformers (that were called procrastinators at a time) from the former Soviet Union (FSU) performed better than the champions of big-bang liberalization – Baltic States and Central Europe. In Belarus, Turkmenistan, and Uzbekistan, for instance, privatization was rather slow – over 50% of their GDP is still created at state enterprises (fig.3), but their performance is superior to that of more liberalized economies. Resource abundance definitely helped resource exporters, such as Azerbaijan, Kazakhstan, Russia, and Turkmenistan, to maintain higher incomes recently, when resource prices were high, but was not a *sine qua non* for growth – resource poor Belarus and self-sufficient in fuel and energy Uzbekistan did much better than resource rich Russia.

As recent research shows, the crucial factor of economic performance was the ability to preserve institutional capacity of the state (Popov, 2000, 2007a, Popov, 2011b for a survey). The story of transition was very much a government failure, not a market failure story. In all former Soviet republics and in East European countries, government spending fell during transition and the provision of traditional public goods, from law and order to health care and infrastructure, worsened. This led to the increase in crime, shadow economy, income inequalities, corruption, and mortality. But in countries with the smallest decline in government spending (countries very different in other respects – Central Europe, Estonia, Belarus, Uzbekistan), these effects were less pronounced and the dynamics of output was better.

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<sup>2</sup> The only exception could be Botswana that had one of the highest rates of per-capita GDP growth in the last 50 years (5% during 1960-2010), which was primarily driven by exports of primary commodities (namely, diamonds) and not of high-tech goods.

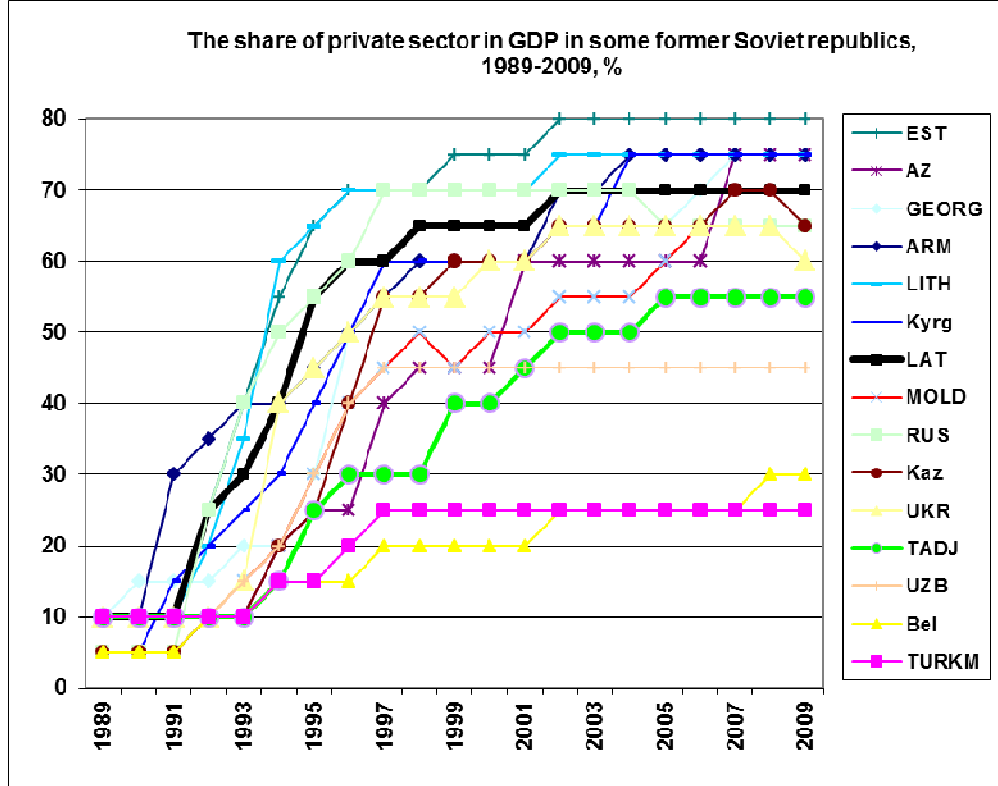
Fig. 2. GDP change in FSU economies, 1989 = 100%



Source: EBRD Transition Reports for various years. Central Europe is the unweighted average for Czech Republic, Hungary, Poland, Slovakia, and Slovenia.

Uzbekistan is very much an economic success story in the post-Soviet space. Its transformational recession was very mild as compared to other countries of former Soviet Union; its GDP more than doubled in 1989-2012 – better result than even in Central European countries (fig. 2), its life expectancy (now 68 years) did not increase much, but did not fall like in other former Soviet republics in the 1990s, its population increased from 20 mln. in 1989 to 30 mln. in 2013, and its murder rate is low (3 per 100, 000 of inhabitants, lower than in the US). In 2009, during economic recession, only Kazakhstan and Azerbaijan showed higher economic growth rates than Uzbekistan, whereas in most other post-communist countries there was a reduction of output.

Fig. 3. The share of private sector in GDP in some former Soviet republics, 1989-2009, %



Source: EBRD.

True, Uzbekistan's performance is not as spectacular as that of China, but nevertheless it, is truly exceptional for the post-Soviet space. Partly it is due to good external environment (Uzbekistan is the exporter of commodities – cotton, gold and gas, whose world prices increased in recent 2 decades); but more important reasons are associated with good macroeconomic and industrial policies. Uzbekistan became the only country in the post-Soviet space that managed to increase the share of industry in GDP, the share of machinery and equipment in total industrial output and in exports. It created a competitive export oriented auto industry from scratch. In 2011 it became 15<sup>th</sup> country in the world to launch high speed train line between Tashkent and Samarkand (to be continued to Bukhara and Karshi by 2015). The train is made by Spanish Talgo and runs a distance of 344 km in 2 hours 8 minutes.

The inclusiveness of growth appears to be higher in Uzbekistan as well. Official estimates for Uzbekistan put Gini in 2012 at just above 30% (World Bank estimates for 2002-03 – 35-36%), which is lower than in most transition economies. Meanwhile, in more liberalized economies of



Russia, Lithuania, Georgia and Kyrgyzstan income distribution is noticeably more uneven (ranging between 0.38 and 0.45 (see appendix fig. 1).

Another indicator of income distribution at the very top is the number of billionaires. The recent count (Forbes, 2013) puts Russia and Georgia ahead of all the others in terms of billionaire-intensity (number of billionaires per \$1 trillion PPP GDP), followed by Ukraine, Czech Republic and Kazakhstan (table 1). Other former USSR countries do not have any billionaires yet, although their PPP GDP is higher than that of Georgia. For instance, Azerbaijan and Uzbekistan were supposed to have about 3 billionaires, if they had a Russian level of billionaire-intensity, but in fact they do not have any.

**Table 1. Billionaires in former USSR, Eastern Europe China, and Vietnam**

	Number of billionaires	Total wealth	PPP GDP, 2012	Number per trillion PPP GDP	Wealth of billionaires to PPP GDP, %
China	122	260.9	12471	9.8	2.1
Russia	110	403.8	3380	32.5	11.9
Ukraine	10	31.3	338.2	29.6	9.3
Kazakhstan	5	9.2	233	21.5	3.9
Czech Republic	4	14.0	277.9	14.4	5.0
Poland	4	9.8	844.2	4.7	1.2
Georgia	1	5.3	26.6	37.6	19.9
Vietnam	1	1.5	322.7	3.1	0.5
Romania	1	1.1	352.3	2.8	0.3
Uzbekistan	0	0	107	0.0	0.0

Source: Forbes billionaires list

([http://www.forbes.com/billionaires/#page:1\\_sort:0\\_direction:asc\\_search: filter:All%20industries filter:All%20countries filter:All%20states](http://www.forbes.com/billionaires/#page:1_sort:0_direction:asc_search: filter:All%20industries filter:All%20countries filter:All%20states)); WDI.

The relatively successful economic performance is even more impressive given that Uzbekistan is not a major oil and gas exporter and is one of two double landlocked countries in the world — that is, a country completely surrounded by another landlocked countries — the other being Liechtenstein. It is important, however, to distinguish between the growth rates and the level of per capita income. Uzbekistan still remains a poor country, with PPP GDP per capita of below

\$US 6000 in 2014 against over \$20,000 in Russia and Kazakhstan, \$17,000 in Azerbaijan, and over \$14,000 in Turkmenistan; and many Uzbeks are migrating to find a job in Russia and not vice versa.

#### **IV. Changes in Uzbekistan's economic structure**

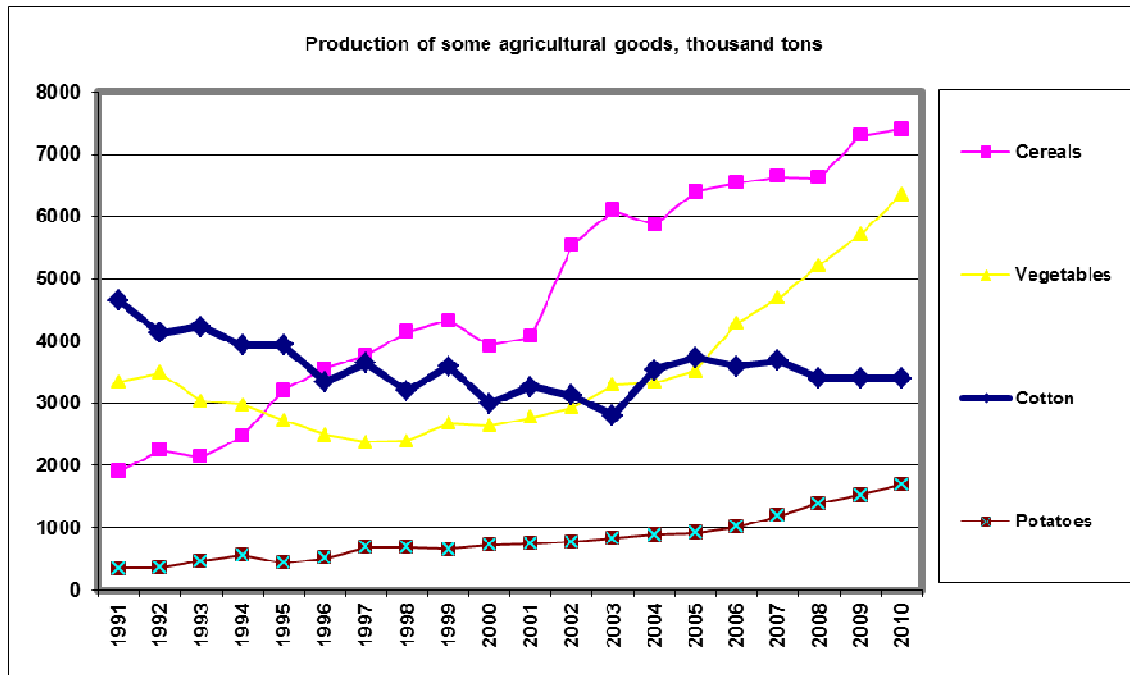
Since independence (1991) Uzbekistan managed to encourage and carry out three important structural shifts in its economy: (1) decrease in cotton production and export and increase in food production, achieving self-sufficiency in food, (2) achieving self-sufficiency in energy and becoming a net fuel exporter; (3) increasing the share of industry in GDP and the share of machinery and equipment in industrial output and export.

Diversification in agriculture was carried out mostly via state orders (less for cotton, more for cereals), so production of cotton decreased by 50% (as compared to the late 1980s) and output of cereals and vegetables increased several times (fig. 4). Increase in gas output was due mostly to state investments (gas and oil are produced by state holding company “Uzbekneftegaz”). And diversification in industry and expansion of manufacturing exports was mostly the result of protectionism and government / central bank policy of low exchange rate. Like China, Uzbekistan maintained a low (undervalued) exchange rate due to rapid accumulation of foreign exchange reserves. In addition, there were non-negligible tax measures to stimulate exports of processed goods (50% lower tax rate for manufacturing companies that export 30% and more of their output).

Although comparable statistics from WDI for Uzbekistan is lacking, national statistics suggests that the share of non-resource goods in exports increased to over 70% against less than 30% in 1990, before independence (Foreign Affairs Department of Uzbekistan, 2013).

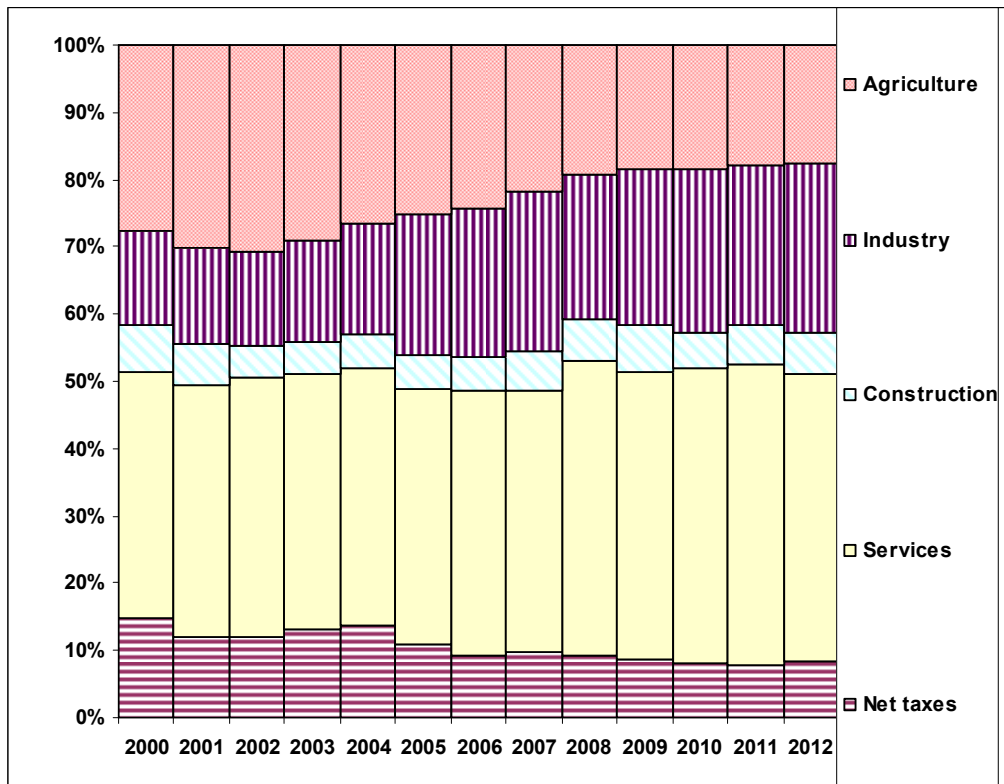
Uzbekistan became one of the few transition countries, where the share of industry increased in recent years (fig. 5). It also managed to upgrade the structure of industrial output – the share of machinery and equipment and chemicals increased at the expense of light industry (table 2). Other post-Soviet economies also experienced the decline of light industry, but it happened together with the decline of machine building that created space for the expansion of fuel, energy, steel and non-ferrous metals.

Fig. 4. Diversification in agriculture



Source: State Committee on Statistics of Uzbekistan (<http://www.stat.uz/en/>)

Fig. 5. GDP structure by sectors of the economy, % of total



Source: WB, 2013.

**Table 2. Structure of industrial output in 1991 and in 2011 in current prices, % of total**

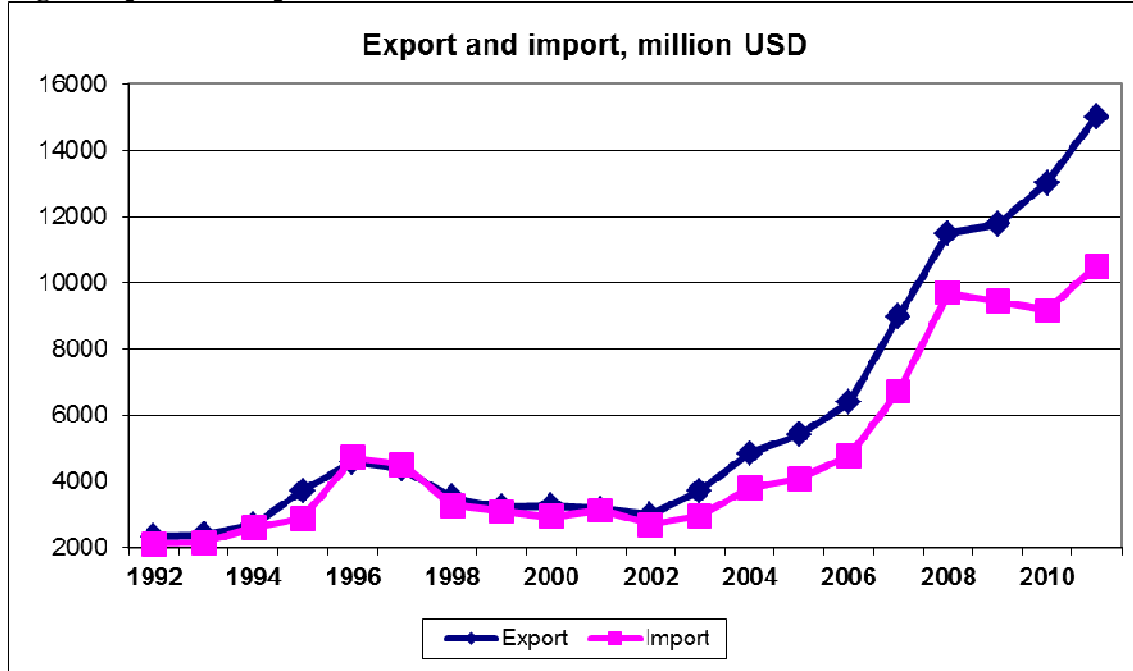
Industry	1991	2011
Electric energy	2.7	8.0
Fuel	3.7	17.5
Steel	0.8	2.6
Non-ferrous metals	9.7	10.4
Chemical and petrochemical	4.0	5.5
Machinery and equipment	11.6	16.1
Wood, pulp and paper	1.6	1.1
Construction materials	4.3	5.3
Light	39.8	13.5
Food	14.8	14.0
Other	7.1	6.1
Total	100.0	100.0

Source: State Committee on Statistics of Uzbekistan (<http://www.stat.uz/en/>)

An auto industry was created in Uzbekistan from scratch after independence behind the protectionist wall. The car production was supported by the government and the Korean auto company Daewoo. After Daewoo went bankrupt, US General Motors became the partner of the government. The government also bought a stake in Turkey's Koc in SamKochAvto, a producer of small buses and lorries. Afterwards, it signed an agreement with Isuzu Motors of Japan to produce Isuzu buses and lorries. In 2014 Uzbekistan produced 250,000 cars, nearly half was exported. In 2011 the engine plant in Tashkent became operational (joint venture of State Auto Company and General Motors) with the capacity of 360,000 engines a year.

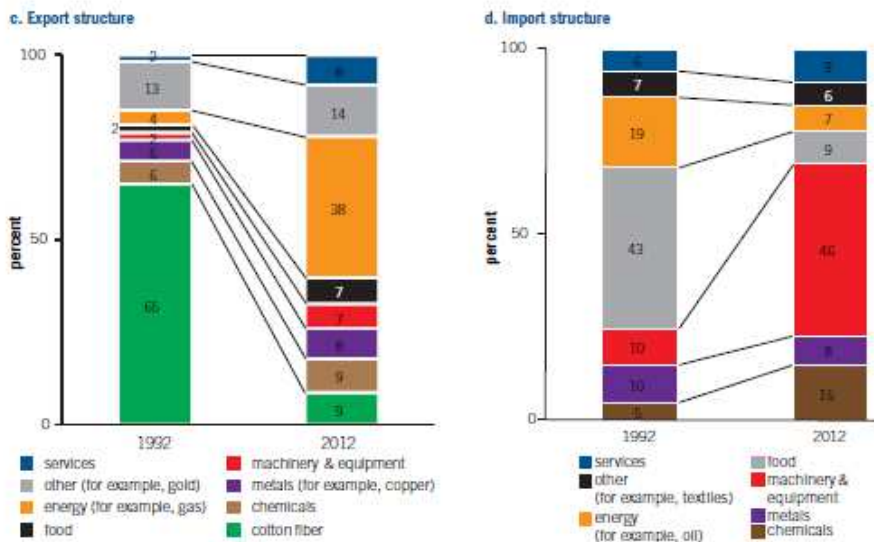
Uzbekistan's exports increased dramatically – from \$2 billion in 1992 to \$15 billion in 2011, or from \$100 per capita to \$500 (fig. 6). The share of former USSR countries in exports fell from over 60% in 1992 to less than 40% in 2012 (see appendix fig. 2). The share of cotton in export fell from 65% in 1992 to only 9% in 2012, whereas the share of fuel (mostly gas) and oil products increased from 4 to 38%, the share of machinery and equipment – from 2 to 7%, the share of chemical products – from 6 to 9%. In imports the share of food fell from 43 to 10%, whereas the share of machinery and equipment increased from 10 to 46% (fig.7).

Fig.6. Export and import of Uzbekistan, million US dollars



Source: State Committee on Statistics of Uzbekistan (<http://www.stat.uz/en/>)

Fig. 7. Commodity structure of export and import, % of total



Source: Trushin, Carneiro, 2013.

In recent years, however, the second round of industrial policy focuses on heavy chemicals - Shurtan Gas Chemical Complex and the planned production of synthetic liquid fuels based on purified methane together with South African "Sasol" and Malaysian "Petronas", liquefied

natural gas production at Mubarek gas processing plant, Dehkonobod Potash Fertilizer Plant, Ustyurt gas chemical complex at Surgil deposit.

## V. Undervaluation of the exchange rate – the main tool of industrial policy

In 2008-2012 Uzbekistan was growing at 8-9% rate, with barely visible decline in growth rates during 2008-09 recession, had a stable inflation of 7 to 8%,<sup>3</sup> a positive fiscal balance and rapidly declining debt to GDP ratio, a current account surplus and growing foreign exchange reserves. Foreign reserves for the end of 2012 were estimated at about \$40 billion (15 months of imports against 5 months in 2004), not including about \$5 billion (2010) in the Reconstruction and Development Fund of Uzbekistan.<sup>4</sup>

However, here Uzbekistan is not exceptional. Many countries of former USSR have managed to put their government finances in order in recent years and enjoy budget surpluses, moderate inflation, and growing foreign reserves. What makes Uzbekistan different and even unique is a policy of low exchange rate. It promotes export oriented development – like in Japan in the 1950s-70s, South Korea in the 1960-80s, China and ASEAN countries since the 1990s (Dollar, 1992; Easterly, 1999; Polterovich, Popov, 2004; Rodrik, 2008; Bhala, 2012 ). Undervaluation of the exchange rate via accumulation of foreign exchange reserves in fact becomes a powerful tool of industrial policy creating stimuli for tradables goods at the expense of non-tradables (Greenwald & Stiglitz, 2013). Former communist countries of Eastern Europe and USSR did not carry out such a policy; on the contrary, their exchange rates were and often are overvalued, especially in countries that export resources (they suffer from the Dutch disease).

Since 2000 Uzbekistan is probably the only country in the post-Soviet space that carries out predictable and **gradual nominal devaluation of the currency** which is a bit larger than needed to counter the differences in inflation rates between Uzbekistan and its major trading partners, so that real effective exchange rate depreciates slowly. The real exchange rate of the som versus the US dollar has appreciated a bit, though not as much as currencies of other

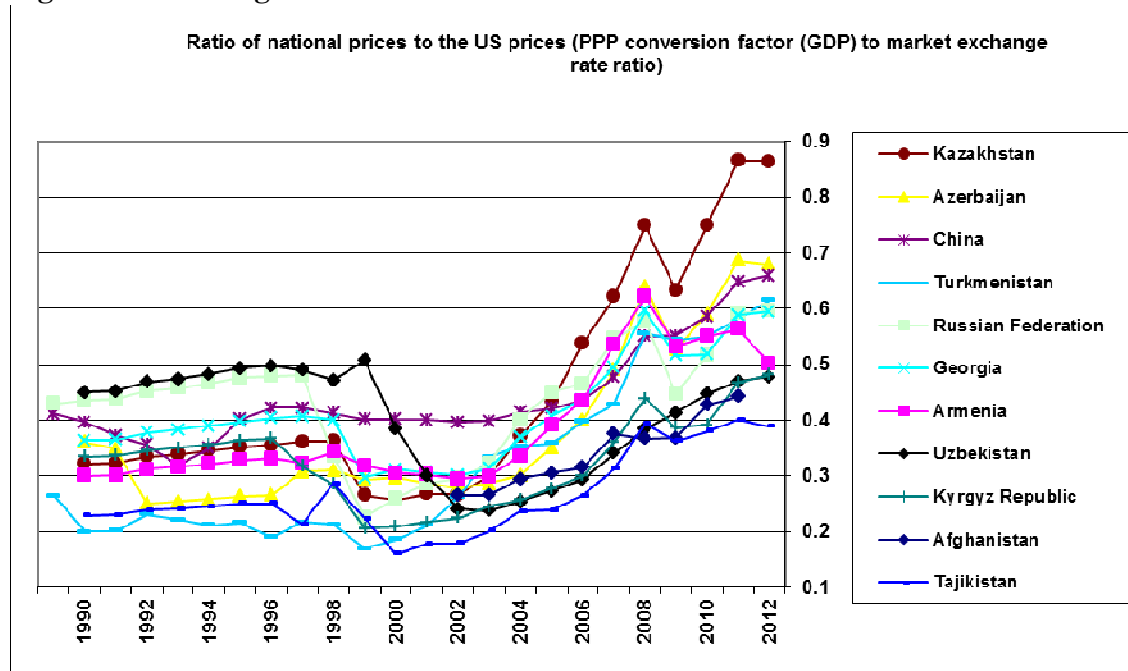
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<sup>3</sup> Alternative estimate of the IMF put inflation in 2012 at 11% (WB, 2013).

<sup>4</sup> In 2006 Uzbekistan's Fund for Reconstruction and Development (FRD) was established. It has been used primarily for sterilization and accumulation of foreign exchange revenues, but officially it was presented as a financial institution for providing government-guaranteed loans and equity investments to strategic sectors of the domestic economy. It was established by Uzbekistan's Cabinet of Ministers, Ministry of Finance and five largest state-owned banks. The equity capital of the fund reached USD 5 billion in 2010. The FRD provides debt financing for modernization and technical upgrade projects in sectors that are strategically important for the Uzbek economy (energy, chemicals, non-ferrous metallurgy, etc.). All loans require government approval. The credit portfolio of the FRD reached USD 871 million in 2010 (BEEBA, 2011).

countries (fig.8). However, the real *effective* exchange rate of som (i.e. with respect to currencies of all major trading partners) decreased by over 50% in 2000-07 – a sharp contrast with other countries of the region on which data are available (see appendix fig.3).

**Fig. 8. Real exchange rate to the US dollar**



Source: WDI.

Exporters in Uzbekistan are forced to submit half of their revenues in foreign currency at a rate that is considerably below the street rate. The rationale is the centralization of foreign currency earnings and import control – it allows the government to prioritize purchases abroad. The Reconstruction and Development Fund of Uzbekistan is now playing the role of both Stabilization Fund and Investment Fund (to finance imports for national projects).

There are other, more traditional, tools of industrial policy – tax stimuli to manufacturing exporters mentioned earlier, government orders and government investment, but undervaluation of the exchange rate is probably the most important instrument.

## VI. Which industries should develop at a faster pace?

Reduction of the share of industry in GDP and the increase of the share of services - an objective process, but in the fast-growing countries (e.g., China), this decline was slower than in others (see appendix fig. 4). At the same time, it appears that the increase in the share of machinery and equipment in manufacturing output, as in China, usually accompanies rapid

growth or even becomes the engine of growth. We do not know of any cases of rapid growth ("economic miracles"), which are based on accelerated growth of the service sector.

What are the particular manufacturing industries that could become the engine of growth is a difficult question. Unfortunately, economic theory does not suggest any definite clues, except the idea that these industries should have the highest externalities, i.e. their social returns should be higher than private returns. But it is not so easy to measure these externalities. Looking at the literature and the experience of countries with the industrial policy, it is possible to find several recipes on how to determine the industries that should be supported.

One can try to support several industries that seem promising, declaring that assistance will end, if the increase in export is not achieved within, say, five years. This is called "EPconEP" – effective protection conditional on export promotion (Jomo, 2013). Economic policymakers in this case are similar to the military commander, who begins an offensive on several fronts, but throws reserves where there has been a breakthrough.

One can try to calculate where, in which specific industries, limited investment will give the greatest effect leading to the creation of globally competitive production. Most likely, these would be industries that lag behind in total factor productivity of the most advanced countries less than the others.

It is also possible to choose largely at random. It is only important to be consistent – embarking on the path of support of a particular industry, not to turn back, even if there is no immediate success and a breakthrough in the world markets. After all, the modern theory of international trade explains country specialization not by comparative advantages, but by "learning by doing".

If the country does not have any comparative advantage, like, say, post-war Japan, it is necessary to create them ("dynamic comparative advantages"), mastering the production of goods that have not been produced before. Supporting such production and consistently encouraging exports, without turning back for some time, is likely to have learning by doing effect, allowing the country to gradually become competitive. As the saying goes, if Japan (that does not possess any minerals or extensive agricultural land) would rely on comparative advantages, its exports today would be not even sushi (which includes rice), but only sashimi.



There are two opposing views on how technologically advanced should be industries that are supported in the framework of industrial policy. Justin Lin, the former chief economist of the World Bank, developed the idea of comparative advantages following and comparative advantages defying industrial strategy: the best result, according to his argument, could be achieved, if countries develop industries that are consistent with their comparative advantages, determined by their endowment structure, and do not try to overleap necessary stages aiming at exporting goods that are exported by very advanced countries (Lin, 2011).

This view is consistent with the "flying geese" paradigm - as more competitive countries move to more advanced types of export, the vacated niches are occupied by less developed countries. It is known that relatively poor countries began to export textiles and shoes, then moved to the export of steel products and heavy chemicals, then - to the export of cars and electrical consumer products (washing machines, refrigerators), then – to consumer electronics and computers. In this case the newcomers could benefit from the experience of other countries by trying to replicate their success.

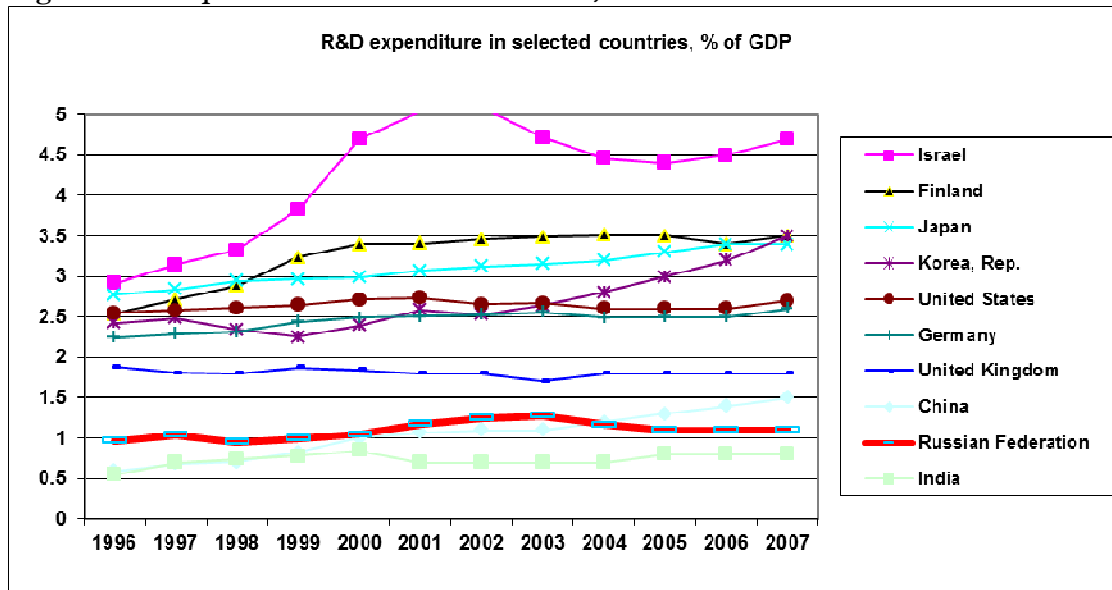
The transition from one exported good to the other could be dictated by the cycle of innovations. As Lee (2013) suggests, this cycle is short for electronics and long for pharmaceutical and chemicals; this may explain why East Asian countries that mostly focused on industries with short cycles managed to avoid growth slowdowns while moving from one export niche to another.

Justin Lin believes that Uzbekistan should not leap over the consecutive stages, going from processing agricultural goods to auto industry and heavy chemistry. It could get greater benefits from developing less sophisticated industries, such as food, textile and leather goods.<sup>5</sup> The arguments against, however, would be the examples of Israel and Finland that at the end of the 20th century mastered the production of high tech goods (electronics) and are now the leading the world in the share of R&D expenditure to GDP ratio (fig. 9).

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<sup>5</sup> Personal communication with Justin Lin. In the general form the theory is presented in (Lin, 2011).

Fig. 9. R&D expenditure in selected countries, % of GDP



Source: WDI.

On the contrary, Ricardo Hausmann, Jason Hwang and Dani Rodrik (Hausmann & Rodrik, 2006; Hausmann, Hwang & Rodrik, 2006; Rodrik, 2006) hypothesize that the more technologically sophisticated the export structure, the greater are the stimuli for economic growth. China, for instance, in 1992 and in 2003 had the greatest gap between the hypothetical per capita income (computed based on the information on technological sophistication of export structure) and actual per capita income, that is to say the structure of the Chinese exports was similar to that of countries with a several times higher level of economic development.

In another article (Hausmann & Rodrik, 2006) the process of transition from production and exports of one goods to the other is compared to the movement of monkeys in the forest from closer trees to more distant trees. The trees that are very rich with fruit are far away, whereas closer trees do not have that many fruit, so monkeys have to compare the movement costs with the benefits of reaching the more fruit abundant trees. Firms, like monkeys, and society as a whole also compare the costs of mastering the new output and export (low for “nearby” industries that are close to existing technologies and high for “far away” industries with totally new technological process) with benefits (externalities) from developing particular industries (allegedly the higher, the more sophisticated these industries are).

In the debate about “picking the winner” generally a distinction is made between functional interventions and selective interventions (Lall 1994). While selective intervention refers to a policy package to create and support the “winners,” functional interventions are those that remedy market failure without favouring any one activity over another. Thus, functional interventions can be termed as “corrective” industrial policy (CIP) and the selective interventions as “directive” industrial policy (DIP). CIP is based on the premise that a properly functioning market economy provides an effective self-regulating mechanism for adapting to structural change. In relation to international trade, CIP rests on the principle of comparative advantage to determine the industrial structure. CIP therefore signifies a movement toward a more market-oriented open economy. To some extent Lin’s position can be placed within the CIP.

On the other hand, the intellectual origin of the directive approach can be traced to the work of Schumpeter (1934, 1939). DIP derives from the notion that structural change is a dynamic process, which is typically discontinuous, disruptive, and unbalanced. Thus, the position of Hausmann, Hwang & Rodrik can be placed within the tradition of Schumpeter and fits the features of DIP.

## **VII. Concluding remarks**

### *Lessons from Uzbekistan*

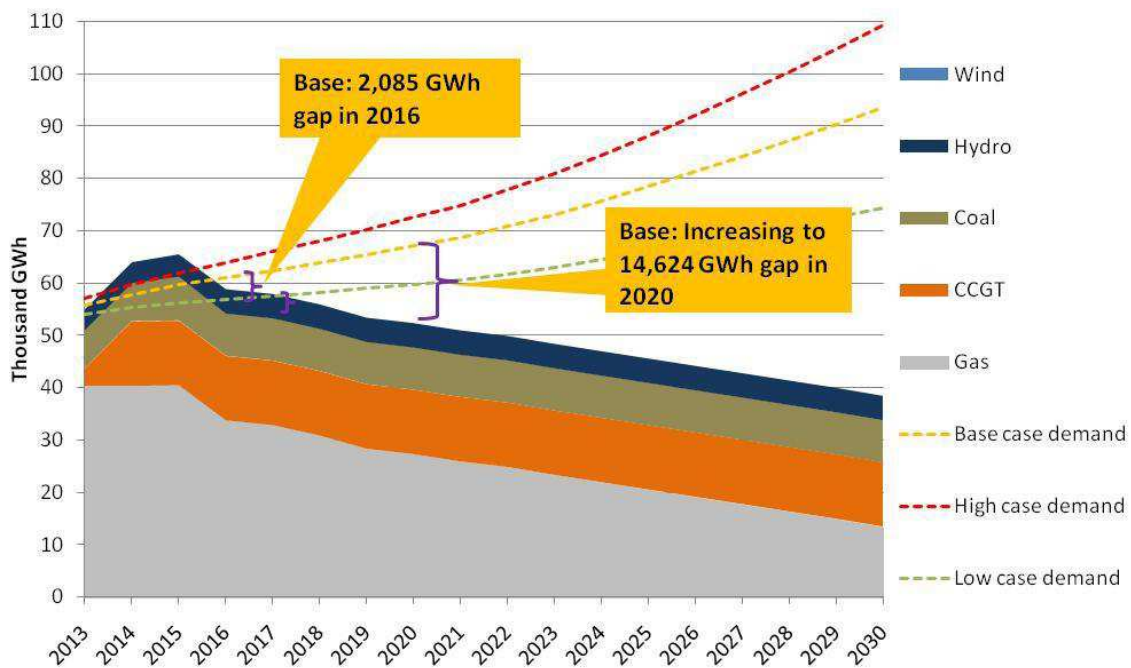
Uzbekistan created from scratch the car industry, which today produces more than 200 thousand cars (and their engines), and half of them are exported (Popov, 2014). It is an undisputable success of industrial policy, a breakthrough to the world markets with the products of the medium level of research intensity, which previously could have been achieved only by countries of higher level of development. It remains to be seen, however, if the second round of industrial policy (with the focus on heavy chemistry) will succeed. The arguments against such a policy (Popov, 2014) go in line with the Hausmann-Hwang- Rodrik’s approach more than with Lin’s approach.

First, the gas reserves are close to depletion, it is projected that gas production will start to decline from 2015 (World Bank, 2013), so the use of gas for the production of polypropylene and other chemical products will lead to a decrease in energy self-sufficiency. If the World Bank forecasts are correct ( fig. 10), Uzbekistan will have to import more oil and (or) gas to satisfy domestic demand for energy, even though today the country is a net exporter of fuel. Besides,

production of synthetic liquid fuels from gas will further reduce already low capacity utilization at two existing refineries in Uzbekistan.

Second, the focus on the development of heavy chemistry industries can lead to slowdown of growth or even to reduction of the level of TFP. Calculations by the Uzbek Institute of Forecasting and Macroeconomic Research (Chepel et al., 2014) show that the level of labour productivity and TFP and the growth rates of these indicators in the past 10 years were the highest in engineering, light and food industries, but not in petrochemicals and chemicals.

**Fig. 10. World Bank forecast of energy production & consumption in Uzbekistan till 2030**



Source: World Bank, 2013.

Third, the focus on medium tech engineering goods (auto industry) has justified itself, it is a proven route, perhaps it would be better to develop success in this area and along these lines of specialization, rather than try to create a new competitive industry from scratch. The scale of the Uzbek economy may not be sufficient to specialize on more than one group of industries.

*What can Uzbekistan learn from Singapore?*

There is a general consensus that like other East Asian economies (South Korea and Taiwan), Singapore could break through in international competitiveness by ensuring a docile labor force

and a market-driven flexible labour market. Although many see the depression of wages through subordination and attenuation of labour rights as purely an industrial relations matter, this in effect was a deliberate industrial policy that keeps the unit labour costs and the real exchange rate low.<sup>6</sup> It was the only alternative that it had when its monetary and exchange rate policies were constrained due to a currency board system until 1973. Even after 1973, Singapore's monetary system maintained the principles of a currency board. Singapore held net foreign reserves equal to about 100 percent of the monetary base and its monetary policy centred on the management of the exchange rate since the early 1980s. An undervalued real exchange rate, achieved through wage-depression, is an economy-wide policy and affects all industries equally. Thus, there was no need for picking the winners, although the government encouraged particular industries, such as petro-chemicals.

Singapore continued to use labour-market, in particular wages policies during the later phase to restructure its industries by phasing out labour-intensive activities. However, it is obvious that at a later phase of development, wage depression is not possible; wages have to rise commensurate with the higher levels of per capita GDP. The symbiotic relationship between the union and the government helped Singapore its economy without union resistance. Being part of the policy-making process, the union leaders understood the need for economic restructuring to remain internationally competitive and helped the government devise compensation packages and retraining programmes for the workers who lost jobs due to restructuring. Singapore government introduced Skills Development Fund (SDF) to collect levies from the “sunset” industries (low-skill, low-wage) and thereby encouraged firms to retrain workers and made sure they remain employable. The employers are also required by law to contribute to workers' retirement funds. The government, by legislating compulsory employer contribution to the government-managed Central Provident Fund (CPF), has been able to create a sense of fairness in industrial relations. As the sunset firms exited under the pressure of rising costs, their workers did not fear losing their entitlements.

In addition, the tripartite wage-fixing mechanism at the national level accelerated the industrial restructuring process. By de-linking productivity-based wage increases at the enterprise level and adhering to the industry-wide average productivity-based wage increases, the system raised the unit labor cost of firms with below-industry-average productivity, and thereby forced them to

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<sup>6</sup> See Chowdhury (2008) for industrial policies in East and Southeast Asia.

exit. This also meant that firms with above-industry-average productivity enjoyed lower unit labor costs, and hence higher profit rate for reinvestment.<sup>7</sup>

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<sup>7</sup> See Salter (1960) for a formal analysis of productivity-linked wage increases and industrial restructuring. It is generally believed that wage increases according to productivity growth are noninflationary, and this forms the basis for labor market deregulation or enterprise bargaining. However, as pointed out by Salter (1960), this will adversely affect structural change, as low-productivity industries would be able to continue operating while the high-productivity activities would lack incentive because their profit margin would remain stagnant. As a result, the overall economic growth would be low and inadequate for lowering the unemployment rate.

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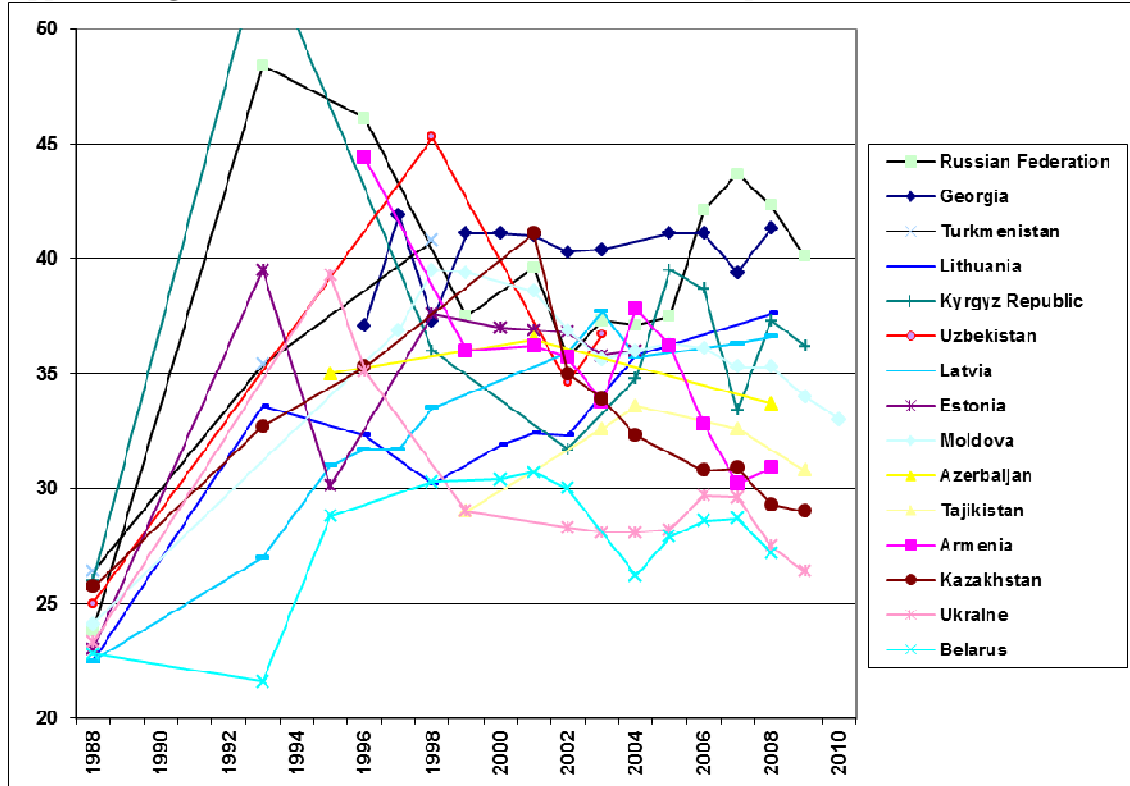
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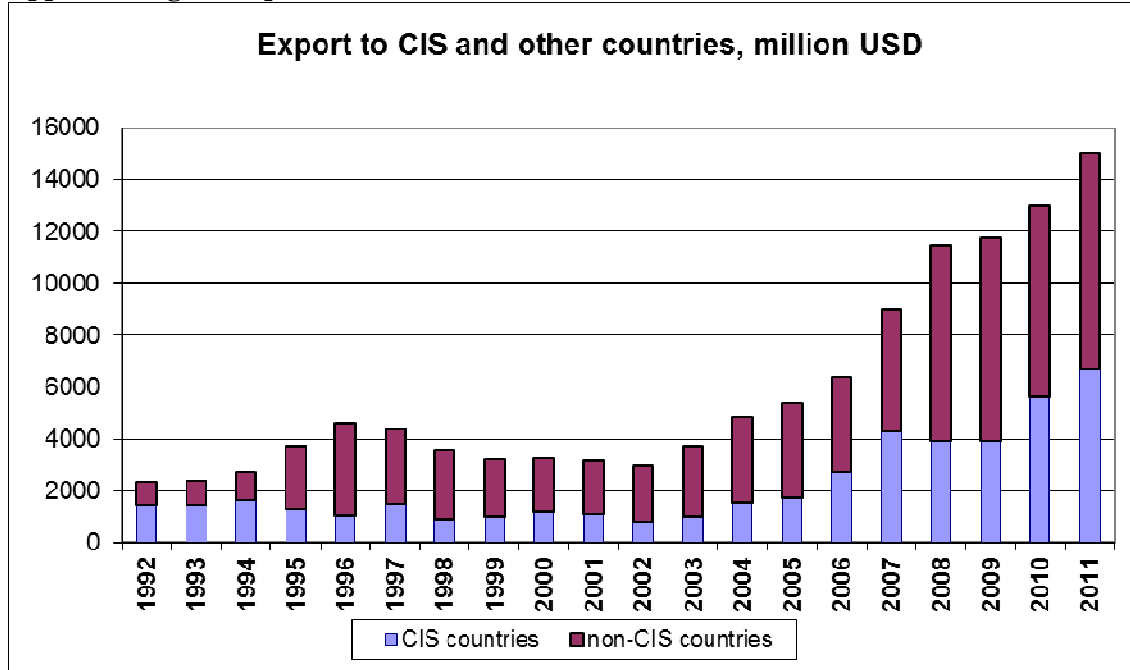
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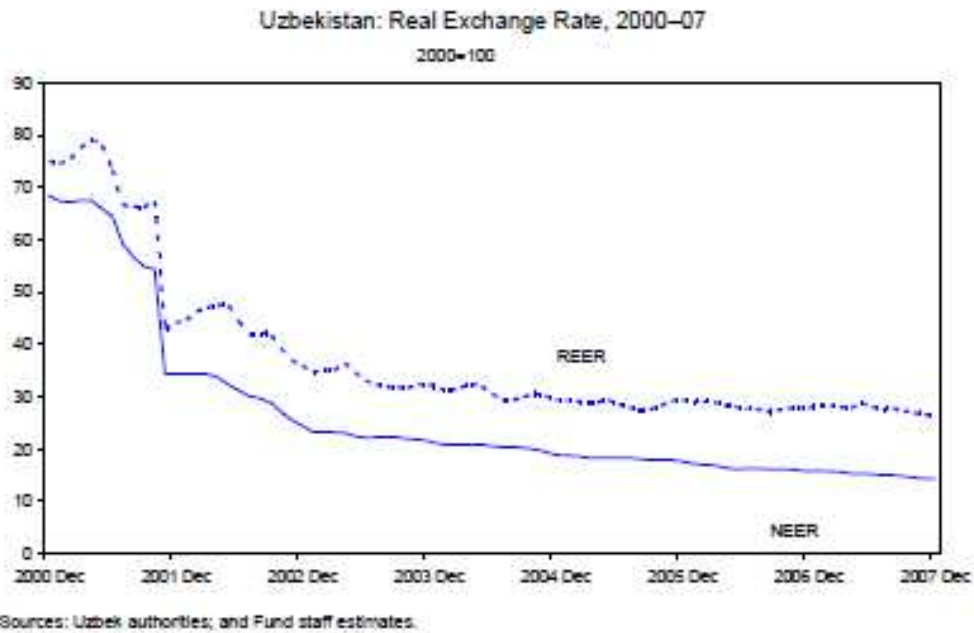
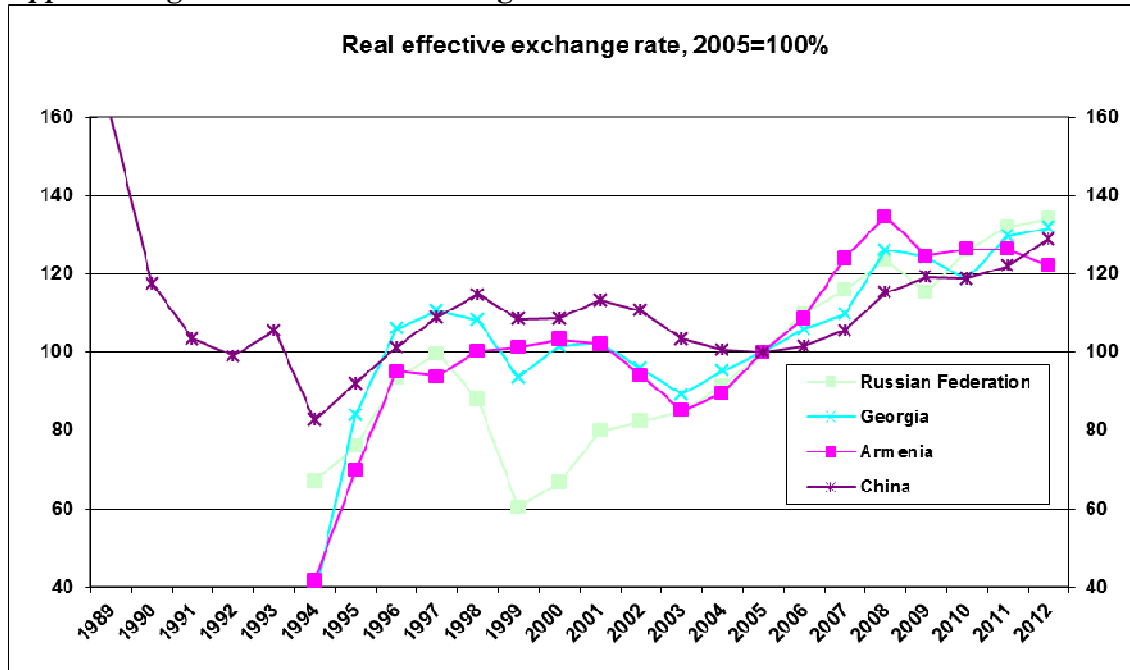
Appendix Fig.1. Gini coefficient of income distribution in post Soviet states



Appendix Fig. 2. Export to CIS & other countries, million US dollars

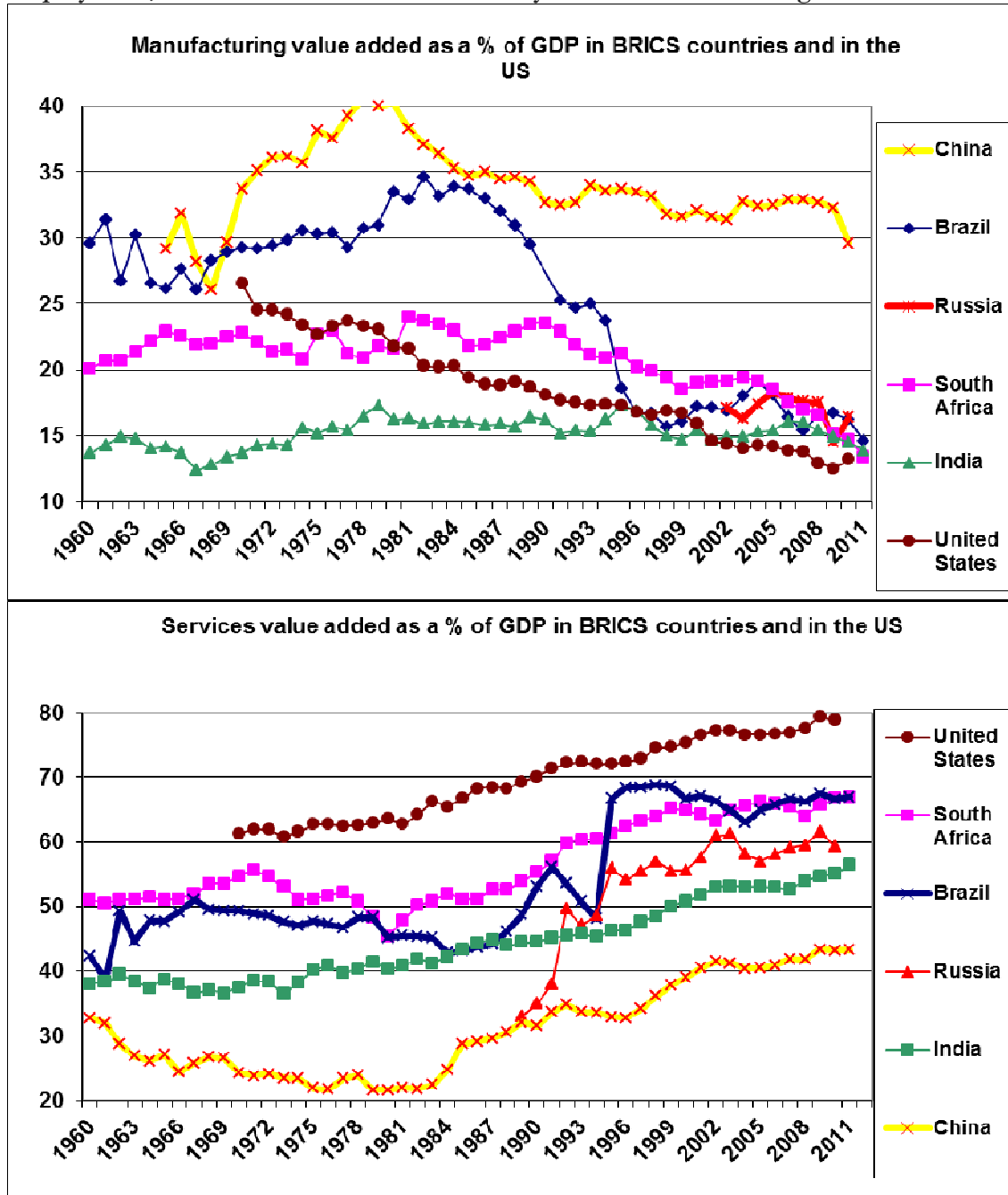


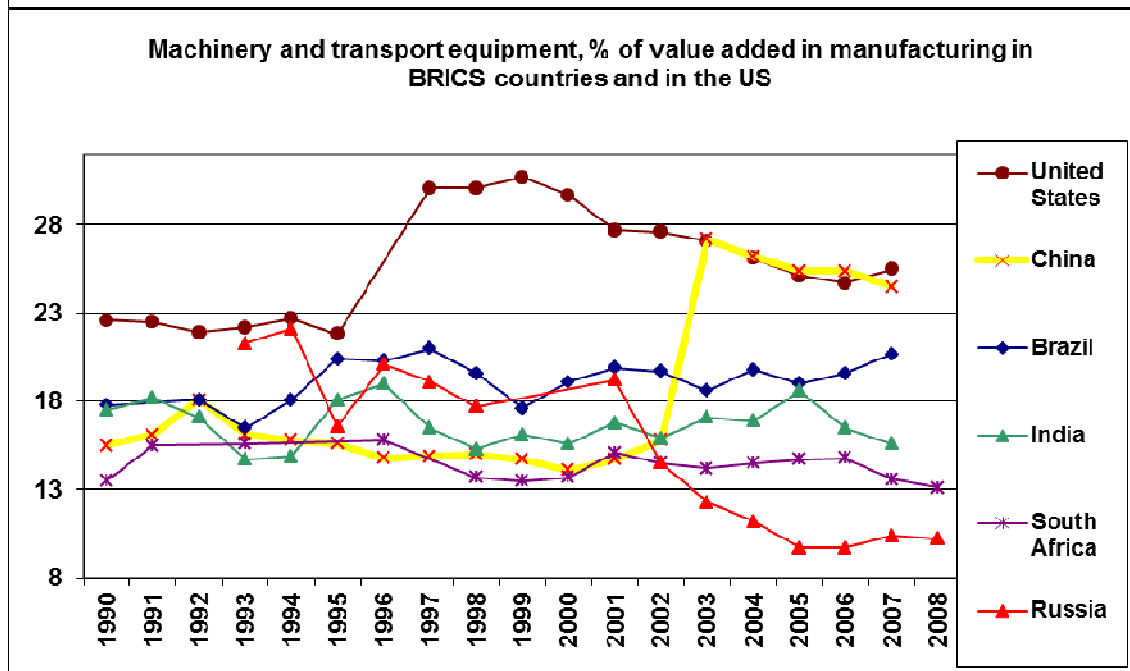
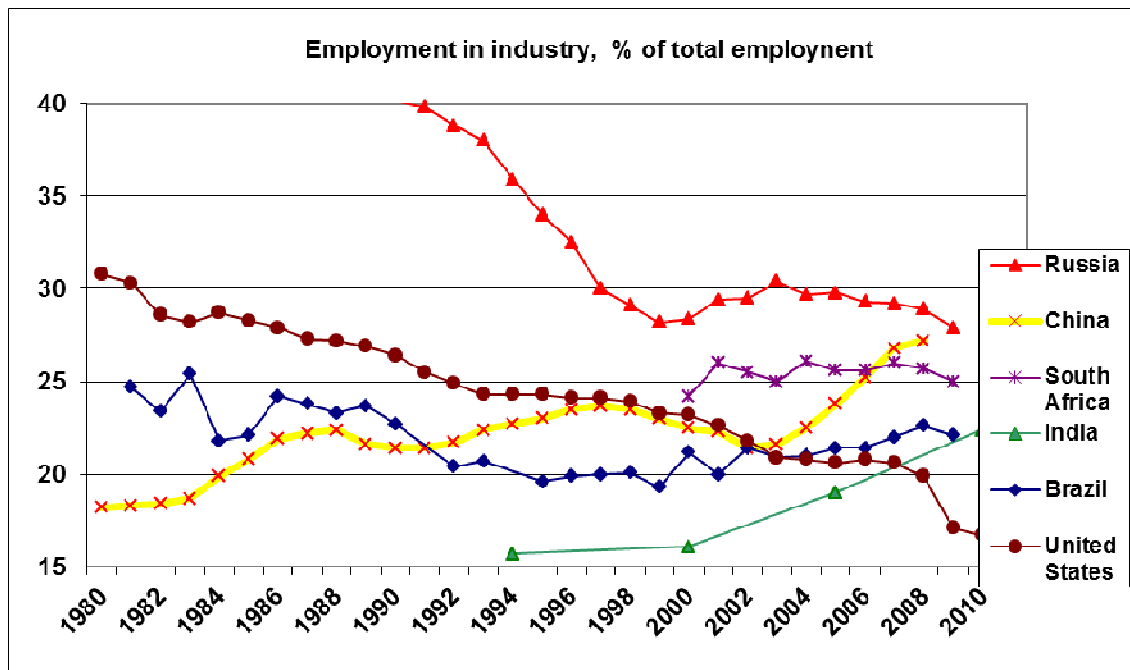
Appendix Fig. 3. Real effective exchange rate of Uzbek som



Source: WDI, IMF, 2008.

Appendix Fig. 4. The share of manufacturing & services in GDP, the share of industry in employment, the share of machinery in manufacturing value added





Source: World Development Indicators.