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EMERGING OF MARKET ECONOMY IN LITHUANIA (1990-2010)

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Abstract. Looking through international literature one can see that almost nobody doubts that Lithuania is advanced in terms of privatization, price liberalisation, opening of its economy. On the other hand, official statistical figures are providing indications that country is failing to assure stable economic development.

The article provides a look into the complex developments of contemporary Lithuanian history (structural changes, such as decomposition of the shortage economy, effects of trade liberalization, inflated bubbles and the shadow economy) and is challenging methodology of national accounting as partially failing to reflect these developments. The evidence suggests that national accounts are likely underestimated Lithuanian gross domestic product (GDP) during the initial transition period of 1989-1994 and market formation period (1994-2003) while growth was exaggerated during the "boom" 2004-2007, and the fall was overestimated in the recession of 2008-2009.

The main objective of the article is to assess the impact of certain transitional factors (e.g. shift from planned shortage economy to the liberal market economy with a mixture of official and shadow activities, opening of economy and cetera) to economic growth and methodology of national accounting. Regression analysis is used to quantify significance of convergence theory. Overview of the literature using Coub-Douglas function to asses potential output.

Based on the modified income data, the annual potential growth during 2003-2010 is estimated to be around 5,3%.

JEL classification: E000.

Keywords: transition to market economy, volatility of Lithuanian economy, national accounting, GDP.

Reikšminiai žodžiai: perėjimas į rinkos ekonomiką, Lietuvos ekonomikos nestabilumas, nacionalinė sąskaityba, BVP.

1. Introduction

Lithuania has experienced substantial political and economic changes since regaining its political independence in 1990. Vast economic reforms include price lib-

eralisation and privatisation of small and medium enterprises during the period from 1991 to 2000. National currency was implemented in 1992-1993 which allowed controlling inflation via national monetary policy. Anti-inflationary policy was hedged by the adoption of currency board regime in 1994. During the first decade of market reforms the institutional aspects of the transition was of the biggest national and international concern and culminated with a granting of a functional market economy status upon EU accession. The quantification of the development has not attracted great interest from the research community until the phenomenon of fast (annual rate of around 7 percent) economic growth in 2001-2007 nicknamed "Baltic tigers" and the "bust" in 2007-2009 with a decline of GDP in comparison to the fourth quarter of 2007 in Estonia, Latvia and Lithuania by 20,14%, 25,5%, and 15,8% respectively. This placed the study of the Baltic region on international agenda. This paper is going to contribute to the understanding of qualitative and structural changes during the whole transition period from a soviet planed economy to a deepened neo-liberal market economy. It will deal with an apparent contradiction existing between, on one hand, internationally acknowledged positive qualitative results of transition and relatively poor quantitative results measured by GDP (the main indicator to measure quantitative changes in economy) dynamics, on the other hand. GDP figures for 1990-2010 recorded as net negative by official statistics contradict with the overall positive assessments of reforms. The article tries to account of removal of the shortage economy, advancements in quality, increasing trade openness, and unregistered inflation during the bubble economy of 2004-2007 and a large increase in shadow economy during the recession of 2008-2009 to produce an estimate of GDP growth alternative to the official statistic. In signs in to complexity of transition have an objective to contribute to the progress of national accounting. The new tool will help move away from a contradictory representation of post soviet development in Lithuania (successful reforms bringing net negative GDP growth) towards more realistic one (reforms were necessary but not perfectly implemented; GDP growth was volatile but net positive).

2. The framework of the transition

Republic of Lithuania declared its independence from Soviet Union in 1990 and immediately started the hard job of simultaneous creation of national state and radical market reforms. The reform process was boosted by the international recognition of Lithuania's independence in 1991. During 1991-1995 reforms were focused on liberalisation of prices and small scale privatisation. By 2000, the economy also experienced trade and foreign exchange system reforms, it became more open to international markets. National currency- the "Litas" - in 1992-1993 helped to stabilize inflation and further encouraged trade. The restrictive monetary policy had been hedged by the adoption of currency board regime in 1994. The currency board system has been updated in 2002 when Litas was re-pegged from US dollar to Euro.

Initial progress in market reforms has been strengthened by radical large – scale privatisation of industrial and financial companies, investments into infrastructure of competition in 2000 -2005.

International recognition of market reforms in Lithuania was acknowledged by membership in the EU since 2004 as well as by assessments of international agencies. In its recent annual assessment of 29 post-soviet countries Lithuania is placed between 10 front runners by the European Bank of Reconstruction and Development receiving best scores for small scale privatisation, price liberalisation, trade and foreign exchange system and second best scores for competition policy, banking reform, and securities markets (Transition report 2010: 4).

3. Outcomes of reforms measured by GDP statistics

The positive assessment of market reforms has to be based on qualitative valuations as well as quantitative ones. Successful reforms have to deliver welfare gains as an outcome of implemented reforms. For the measurement of welfare dynamics, GDP is going to be used.

According to the official international statistics GDP growth in Lithuania was as follows:

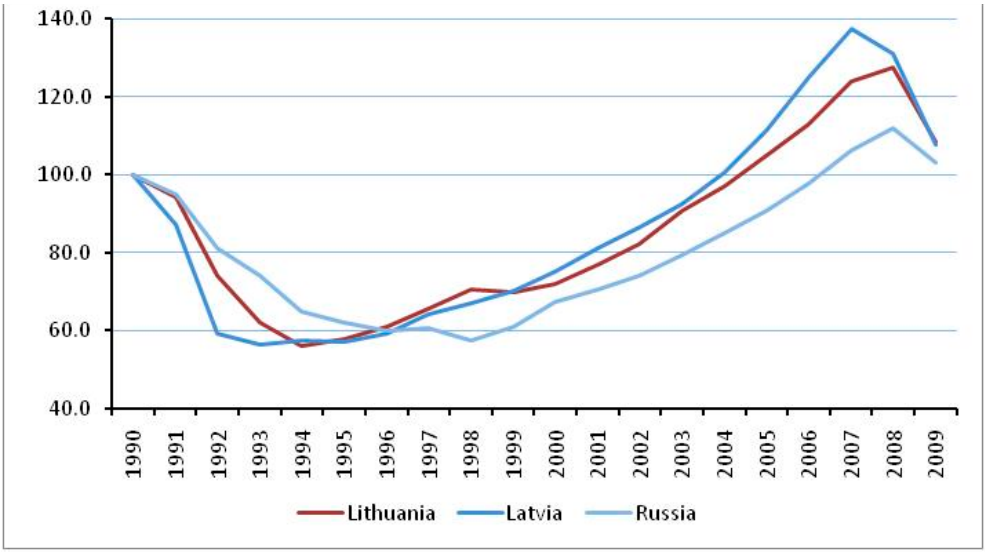


Figure 1. Real gross domestic product (index, 1990 = 100)
Source: World Bank database (June 10, 2011)

Though there will be no specific analysis of Latvia and Russia in the paper, figures for these countries are included to indicate research opportunities provided by the paper.

To fully trust official statistics would mean that after 20 years of transition, Lithuania's GDP is only 5% greater than in 1990. If we would find the cumulative value added (by summing up the differences between GDP recorded in 1990 and every other year until 2010) this would equal a loss of 280,8% of gross domestic product attained in 1990. According to data, similar outcomes of reforms can be observed in Latvia and Russia. This would mean that highly welcomed reforms and structural changes (in the region under scrutiny) did not lead to significant improvements in welfare of the countries. On top of this, the 2008-2009 recession showed concerns what regards sustainability of moderate achievements of regional economies. If the reforms have materialised just in minor positive quantitative gains, questions start to arise of whether the changes were for the better.

Under the assumption that real GDP (measure of welfare) has not been growing, Lithuania's residents would not have reached any higher standard of living when compared to the Soviet era. Low standard of living coupled with the psychological impact of moving towards the market system would question the overall need to reform or at least the road map reformers had followed.

There are a number of indications which suggest that the official data failed to represent adequately transition period especially in countries that have to combine fast and radical economic reforms with the need to build a nation state. According to official statistics used by the World Bank during the period of 1990-2010 Lithuania has been outperformed by countries like Poland which started their reforms earlier (the fact may support arguments of those advocating even faster reforms in Baltic region) and those like Belarus who have extended the reform process (the fact may support arguments of those advocating much less radical reforms). Furthermore it would be difficult to explain why 20 years period of net economic losses did not result in mass protests and civil unrest in Lithuania as well as other countries of concern.

Complexity of the initial transition period makes the evaluation of welfare as reflected by officially accounted GDP difficult. Various databases, such as the International Monetary Fund and Eurostat in recent publications does not present Lithuanian GDP figures for years 1990-1994, presumably admitting that some of the factors could not be adequately capture by the figures. Other databases, however, such as European Bank for Reconstruction and Development, the World Bank and National Statistics do publish the data. We would argue in favour of finding the middle ground between these two options by looking for more precisions in accounting of GDP during initial period of transition.

In order to assess the accuracy of official statistics during the whole period of transition, the years 1990-2010 has been divided into four parts: the initial transition period (1990-1994), the market formation period (1994-2003) marked by intense opening up of the economy to international markets, the boom period (2004-2007) marked by deepening into the EU and bubble formation, the recession which faced the backlash of deepening. Arguments have been presented for each of the periods that list factors unrecognized by the statistic. The re-estimated time series of GDP data had been developed by adding correction coefficients to each period.

4. Initial transition period (1990-1994)

The initial transition period for Lithuania, which ranged from 1990 to 1994, has witnessed a 43,86% fall in real GDP and 318% annual inflation, as presented in World Bank databases.

The transitional recession was immense partially because of structural changes. Over industrialization typical for the former Soviet Union had to be restructured for a heavy price. Decision of states like Lithuania to reduce drastically production of military goods as well as to go for subsidy elimination, had negative impact on GDP. Radical diversification of supply chains, an inflow of new substitutes, caused large portion of domestic industry production to fail (Blanchard 1996). Painful process of learning how to perform in new unfamiliar environment of international markets pressed industrial enterprises to halt capital investment thus reducing recorded GDP and potential output.

There is no doubt that the decrease in real GDP during 1990-1994 was large, but there are reasons why it is probable that the decrease was overestimated. This was due to pure methodological changes, decomposition of the market economy, improvements in consumer choice and quality from opening up to markets.

Methodological challenges. Data was particularly unreliable during the Soviet era. The method of sampling that was used to collect data is inferior to contemporary sampling techniques (Gavrilenkov and Koen 1994). Furthermore, inflation during last decade of Soviet era was hidden because of fixed prices and was manifesting itself in shortage of goods. Low international (on quality grounds) competitiveness of local products has been hedged by the factor of closed economy with very limited presence of internationally produced goods on local markets. Even though Lithuanian department of statistics has been depoliticised in 1990, the methodology did not experience major changes until 2000. Data was inaccessible for several methodological reasons, including the concern of classification of government owned enterprises and their transactions and valuation problems (Bloem and others 1996).

Decomposing of the shortage economy. Prior to 1990 planned Soviet economy with limited role of market forces faced permanent shortage of goods and services. Liberalisation of prices in 1990 -1994 had appeared to be the cure for shortages in an economy as it was the case in most of post soviet economies in Central and Eastern Europe (Hunter and Ryan 2011). The price for the improvement was an increase of price level during 1990 – 1994 considered by official statistics as an increase of the consumer price index (CPI) and thus reducing real GDP by up to 20 percent. We would like to argue that the increase in CPI just because of disappearance of physical shortage of goods has very little to do with the decrease of real GDP.

Radical improvement in consumer choice and quality. The liberalisation of economy and opening up of internal and external markets increased the number of substitutes available to intermediate and final consumption. This had two effects. First, increased competition forced diversification of products and the increase of unit costs of production because of reduction in economy of scale and additional costs needed for market-

ing of products. The factors pushing prices up had been recorded by consumer price index. The second outcome of market liberalisation and opening had been the benefits from increased consumer choice seen as a net gain for consumers. While output of certain individual industries declined, the welfare had partially increased as unneeded goods were taken away and valuable ones placed into the market. The welfare gains related to consumer choice have not been recorded neither in dynamics of nominal GDP nor in dynamics of CPI thus leading to underestimation of economic growth in 1990-1994.

Qualitative studies in Russia, Poland, Check Republic and Slovakia point that there are large discrepancies between dynamics of consumption and output during initial stages of transition (Gavrilenkov and Koen 1994), which reduces the growth loss from 18% to 5-10% in Poland (Rajewski 1993), and from 50% to 33% in Russia. Based on factors described above (decomposition of shortage economy, radical improvement in consumer choice and quality) statistical trends in Lithuania resemble Russia's transition, and for this reason a 33% decrease instead of a 43,86% fall from 1990 to 1994 will be used in calculations.

5. Market economy formation (1995-2003)

This period in Lithuanian history is marked by steady growth of the economy until a recession in 1999. Average annual growth was around 5,4% for the period. The move towards a liberal market economy was annually followed by the EBRD (Transition report, 1998) and topics of openness of trade, privatization and governance indicators were analyzed. During the formation period most of the challenges statisticians had been facing in the initial transition stage had been over but some new difficulties had appeared.

Terms of trade. As a result of the collapse of the Soviet Union, Lithuania gained access to world markets to an extent which it never had before. Research suggests that opportunities alone allow a much greater increase in welfare (Andrew B. And others 1999). If a good of equal quality has lower prices in foreign markets, then it makes sense to spend less to maintain your consumption constant: increase in real income and welfare because of imports. Analogically, if Lithuania's good is worth more, it can be exported and for the same bundle of goods a higher income recorded: increase in real income and welfare because of exports. While initially Lithuania was likely to benefit more from the former, the potential for the latter became evident at later stages.

National statistics did not account for changes in international trade. Kohli's (2004) calculations gave evidence for international trade based 10% increase in income in Switzerland from 1980 to 1996, or 0,6% per year . During the first years of market reforms real gains related to the international division of labour had been limited because of limits in corporate governance and loose Lithuanian financial sector. During 1995-2003 governance in industrial and finance sectors has been improved and it is

likely that the trade benefits added similar value for Lithuania's economy as calculated in the case study for Switzerland.

Upgrading quality of goods and services. While this is a general problem faced by statisticians and econometricians (Smith and Street 2007, European Commission 1999), it is of particular importance for economies in transition from planned to market economy. The reforms compressed in time meant that the bulk improvement in quality of goods (physical characteristics, safety, diversity of supply, consumer choice), have altered radically during a period of less than a decade. In quite many instances the change required to reduce quantity of production (the factor accounted by official statistics as reduction of GDP), for the sake of higher quality (the factor not accounted by official statistics as increase of GDP) goods and services (Melitz and Waysand 1996).

Move from tradable goods to non-tradable goods. The Soviet Union was biased in favour of tradables and pursued a policy of lower wages and subsidies in industry to compensate for the inquired costs instead of purchasing labour from the service sector (Coricelli and Jazbec 2004). As services were in a relatively large demand unmet by the supply, market reforms led to a shift towards service production, which should have increased welfare. The immediate effect was a reduction of output in the tradable sector which was fairly accurately reported by the statistics of industrial output (except for the deliberate manipulation to attract attention and further subsidies (Coricelli and Jazbec 2004).

To account for these changes, a cumulative 5% increase in value will be added over the period (0,54% per year).

6. Boom period: 2004-2007

During this period, Lithuania experienced large growth. Part of this can be explained by utilisation of unused material and non material resources. There was substantial official unemployment (12,5% in 2003) and structural hidden unemployment in rural sectors of economy (share of labour force in agriculture accounted for 22,3% in 2003) and unused, assessable capital. Furthermore the potential that has been created during market formation period in terms of access to new markets, product creation, and knowledge build up contributed to the growth.

In 2004 Lithuania entered in to the third stage of its transition. While the process of exporting to more countries has already been well utilized, by joining the Single Market it started to *deepen* its economic ties with the European Union. Neo-Liberal ideology prevailing in Lithuania since late nineties started to give fruits. Fiscal stability of the country and fixed currency rate strengthened by the currency board arrangements had convinced international markets in opportunities to invest in Lithuanian economy. Credit based growth of Lithuanian economy boosted further by EU structural funds had been reflected by official figures of annual GDP growth at the level of 8,2 percent. Are there any factors of GDP dynamics which are likely to have been unrecorded by of-

ficial statistics during the period of boom period 2004-2007? Opportunities to consider re-estimation of GDP dynamics are as follows:

Credit based growth. Credit based growth is a medium term instrument, not a permanent technological change. Lithuanian economy moved from a point of low external private and public debt (43%-45% of GDP) in 2001-2003, to a high point of external debt (63%-76% of GDP) in 2006 -2007(EBRD, database), thus undermining opportunities for sustainable growth in future.

Inflation in real estate market. . The price of a square meter of a private residence had increased from 2000 to 2007 by 360%. National statistics show that prices of private residences have increased just by 60% (Statistics Lithuania). The difference provides an argument what regards underestimation of deflator and overestimation of GDP growth.

Profits. Likely overvaluation of real estate led property developers and banks to earn supernormal profits which were included in GDP calculations. The commercial banks saw their profits almost quadruple from 2003-2005 to 2007. Corporative profits in Lithuania more than doubled from 2005 to 2007 (according to the official statistics share of corporative profits in GDP was 10, 5% in 2005 and 20,5% in 2007. Such an increase is partially explained by annual inflation accelerating from 2.7% in 2005 to 5.7% in 2007. In Poland, which was not marked by extensive net capital inflows, share of corporate profits in GDP were 6, 6% in 2005 and 6,2% in 2008 (*Concise Statistical Yearbook of Poland*).

Public sector value added. Larger inflated profits meant larger inflated tax revenues and consequently - the public sector's larger funding. Since in Lithuania the value added by the public sector is accounted in GDP as equal to the allocated funds from the state budget, larger funding meant higher output. The issue of non-tradable was already noted in the last section. Since the funding of public sector doubled, inflated output growth was recorded in the statistics.

To account for these overestimations, a 6% commutative GDP reduction will be incorporated in to GDP statistics for this periods.

7. Recession period and recovery (2008-2010)

In Lithuania as well as in the whole Baltic region recession of 2008-2009 has presented a mix of global and regional transitory factors, latest being the subject of the article. One may argue that it is not correct to talk about ongoing transition 6 years after Estonia, Latvia and Lithuania have joined the EU. The latest research of the European Bank of Reconstruction and Development gives Baltic countries average scores close to 4 on a transition indicators range from 1(rigid centrally planned economy) to 4+(standard industrialised market economy) thus indicating the transition period is close to over. On the other hand, "record breaking" figures of recession in the entire region (see picture) indicates vulnerability of local economies with regard to external and internal shocks.

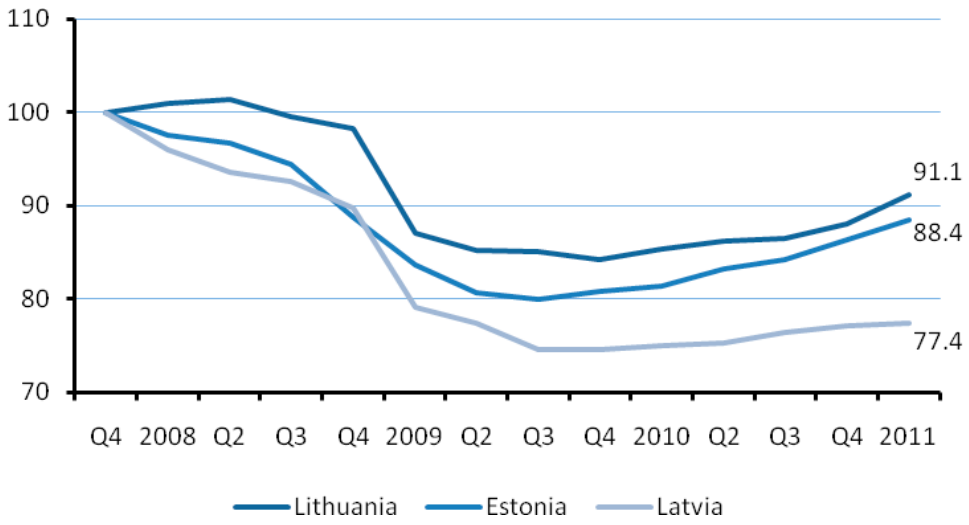


Figure 2. Real Gross Domestic Product by quarter, seasonally adjusted (index, 2007 quarter 4 = 100)
Source: Eurostat Databases (June 10, 2011)

External shocks are particularly important, since the largest share of financial flows during the boom period came from abroad which was subsequently drained from Lithuania in 2009-2010. Lithuanian private and public external debt increased on an average of 25,9% per year during the boom period, and the banking sector made up an increasingly large (47,94% in first quarter of 2008) part of the total external debt, as compared to 14,3% in 2003 (Lithuania's Central Bank). Following the market crash about 3.2 billion US dollars had to be withdrawn by the commercial banks.

Table 1. Net external borrowing as percent of GDP in Baltic countries

	2001	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**
Estonia	4,8	9,9	10,8	10,7	9,4	13,6	16,2	7,7	-7,8
Latvia	7,1	6,4	7,5	11,8	11,2	21,3	20,4	11,6	-11,1
Lithuania	4,7	4,7	6,4	6,8	6,1	8,9	12,9	11,2	-7,0

Source: Eurostat Databases (June 10, 2011)

The radical shift from extensive net borrowing in years 2001-2007 towards net lending in 2009 is one of the main factors explaining similarities of recession in the Baltic region. Latvia has experienced the biggest shift in external borrowing as well as the strongest recession.

In previous sections we have argued the probability that during 1990-2007 statistics of GDP permanently faced difficulties to match peculiarities of economies in transition. Certain difficulties may be indicated for the period of 2008-2009. Negative

profits and a substantial increase in the shadow economy are two factors that are omitted from GDP in Lithuania.

Negative profits. The profits of commercial banks suffered a loss of 4 billion Litas (1.6 billion US dollars) in 2009 (Lithuanian Department of Statistics Database), indicating that much of the value added by the banking sector in the period of 2003-2007 was overestimated. In terms of accounting, this was a severe blow to the economy, as the fall comprised of around 5% of GDP. The profit fall was largely due to mortgages which lost up to 50% of their 2008 value. We have already argued in favour of discounting in GDP calculations role of inflated profits during the boom time. The same arguments will be in favour of reducing the scope of fall during the recession.

Shadow Economy. Decline of GDP caused by multiple factors (collapse of net borrowing has been supplemented by decline of exports and a fall in consumer confidence) has pressed Lithuanian government to increase taxes. Higher taxes had created incentives for tax evasion. The share of shadow economy in Lithuanian GDP had increased from 17,8% in 2007 to 24,3% in 2009 according to estimates of Free Market institute (2011: 4). The factor of shadow economy is important for the tuning of GDP time series, since official statistics has limited capacity to capture business cycle of shadow economy. Analysis of shadow economy is also important for the judgment about comprehensiveness of market reforms. Taking in to account that the rule of the law is an integral part of well established market economy the fact that the shadow economy is so vibrant shows that the transition process in Lithuania has not yet ended.

Public sector value added

Increased taxes (partially because of shadow economy growth) had not prevented tax revenues from free fall. Spending cuts in public sector had been introduced (for example, National statutory health insurance system had reduced in 2009 prices paid to providers of health services by about 10 percent) thus reducing value added in public sector officially recorded by Lithuanian Statistical Office.

According to our estimates the decline of GDP in 2009 was overestimated by about 6 percents. Growth of shadow economy was the biggest contributor.

8. Lithuanian GDP in 1990-2010: Official statistics versus modified data

Resent 20 years of economic development had been divided in to four periods. It looks quite likely that GDP statistics for each of the periods have certain room for fine tuning:

- For years 1990 -1994 certain failures to capture *Decomposing of the shortage economy* and *radical improvement in consumer choice and quality has resulted in underestimation of GDP*
- *For years 1995-2003* difficulties to reflect growing utilization of international markets *has resulted in underestimation of GDP*
- For years 2004-2007 difficulties to precise figures for inflation in economy fu-

elled by extensive mainly private external borrowing and immense growth of public sector financing *has resulted in overestimation of GDP*

- For years 2008-2010 difficulties to reflect growing shadow economy and price cutting for social services introduced by public authorities *has resulted in underestimation of GDP*

The picture shows a comparison of official GDP data with data modified according to above listed arguments.

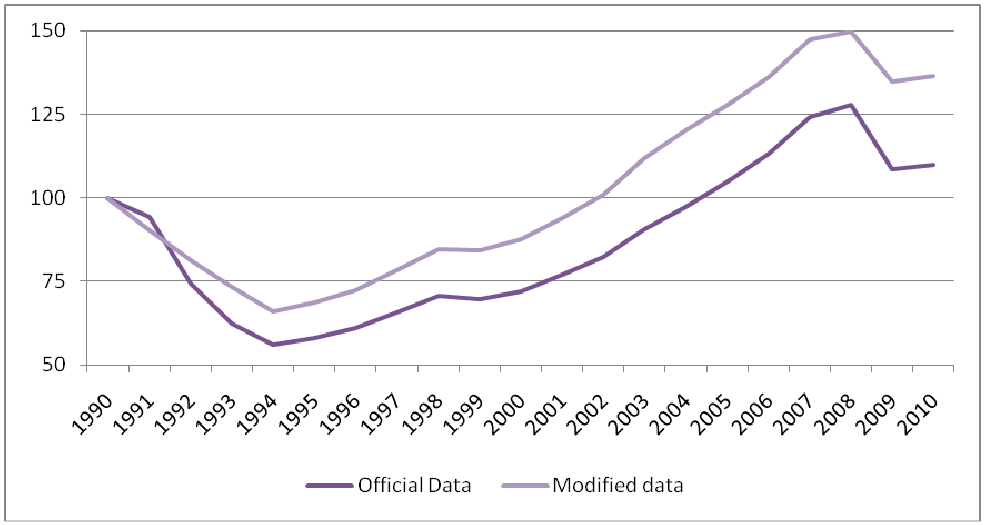


Figure 3. Real GDP growth as represneted by official and modified data
Source: Lithuanian Statistics databases, authors calculations

The main conclusions regarding these time series are as follows:

- Even if modified data as well as the official one indicates very strong recession during the initial stage of the transition, our perception of transitional dynamics is more positive. It is quite likely that the level of GDP recorded in pre-reform period (1990) had been recovered not in 2004 but in late 2001. The shorter period of recovery better corresponds to the fact that Lithuanian society never had lost hope in market reforms and there was no social unrest to be recorded. However, the depth of recession has to be accounted as a warning for current and future reformists not to underestimate real threats related to radical reforms. Analysis of forgone opportunities in 1990-2000 is out of the scope of the article.
- Figures regarding likely overestimation of economic growth during 2004-2007 also provide additional insights in to the economic history of the period. Lower growth (in comparison to figures recorded by official statistics) helps us better understand immense net emigration from Lithuania during that period as well as relatively high level of social distress (manifested itself, for example, in very high suicide rates).

- By looking at growth through modified data during the economic recession during 2008-2009, we are able to gain a better understanding of relative social calm in Lithuania (with the exception of a single social unrest with no fatalities in winter of 2009) as well as insights to understanding most recent economic developments (for example, it is likely that fast GDP growth in year 2011 is partially influenced by the overestimation of the 2008-2009 recession).
- After 20 years of transition Lithuania has regained the level of cumulative output that was lost during the transition phase, disregarding discounting factors. The modified data shows that the net gain was 45,6% instead of 280,8% of GDP loss if measured in 1990 levels.

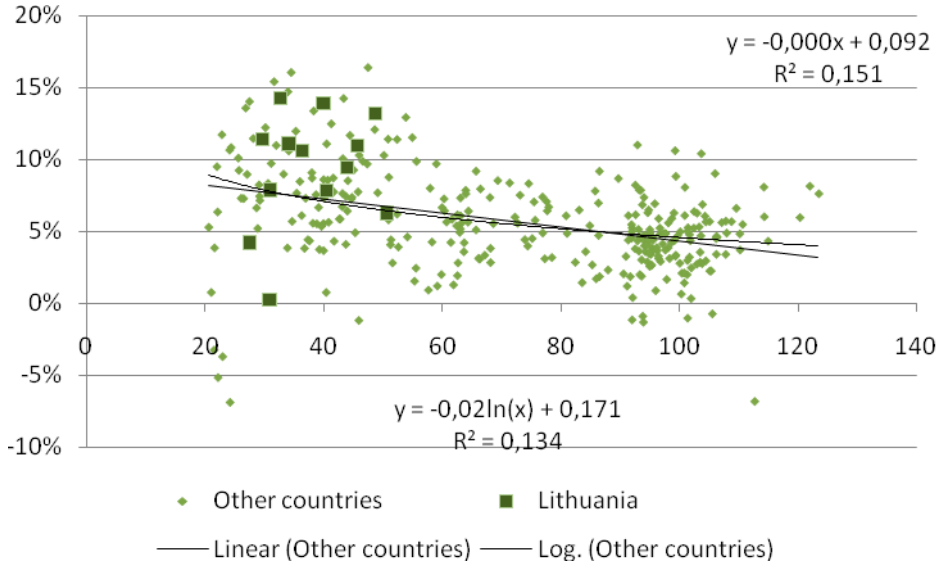
The authors are aware about the importance of verifying modified data and do hope the inclusion of public authorities and international research community in to the process. Further discussions should provide a more precise measurement of economic growth in Lithuania in years 1990-2010 as well as contribute to development of statistical tools to capture realities of transition.

The calculation showed that targeted research is probably needed to adjust classical methods to estimate dynamics of GDP to realities of economies in transition and even certain stages (e.g. initial stage, market formation) of this transition. Our article provides arguments that quality of goods and services and choice, the shadow economy, non-tradables, as well as trade liberalization were 4 factors that official statistics have difficulties to capture effectively. Each stage of transition requires separate factors to be considered in national accounting. However, as transitional economy asymptotes towards western models, international statistical techniques will be able to capture trends more accurately.

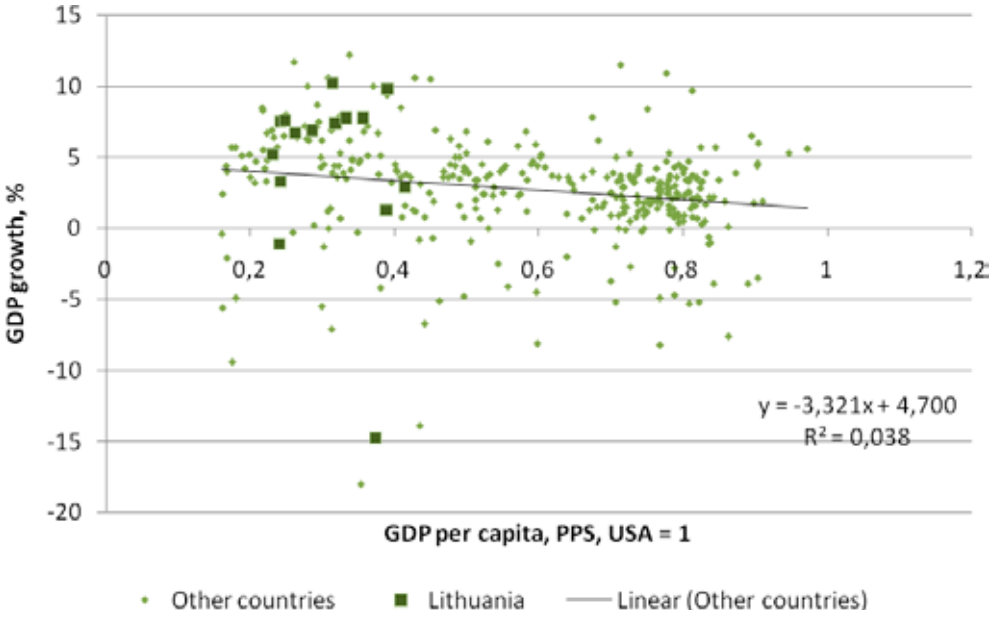
9. Dynamics of real GDP and the potential output in 2000-2010

Both decades of economic development in Lithuania have elements of transition towards standards of industrialised market economy. Trends observed in the second decade have much more in common with realities reflected by the statistics as well as econometric models applicable to OECD countries.

Membership in EU provokes the researched to try the simple way first. Let's assume that market forces alone are doing the job in the single market and the performance of these forces is leading to the fast convergence of economies. Transitional economies are learning from advanced ones GDP growth in the former is much faster. Figure presenting calculations for convergence of EU economies shows that on one hand the fact of convergence in Europe is supported by the statistical data, but the convergence hardly to be considered as the main determinant of economic growth in respective countries. Data is used from the United Nations data base. GDP is measured in Purchasing power standards. GDP of Sweden is considered as 100. GDP of other European countries is presented as percentage of GDP per capita to that of Sweden. Data is from years 1995 – 2008. Annual GDP per capita growth is presented on Y axis. The regression is $y = -0{,}00048x + 0{,}09206$.

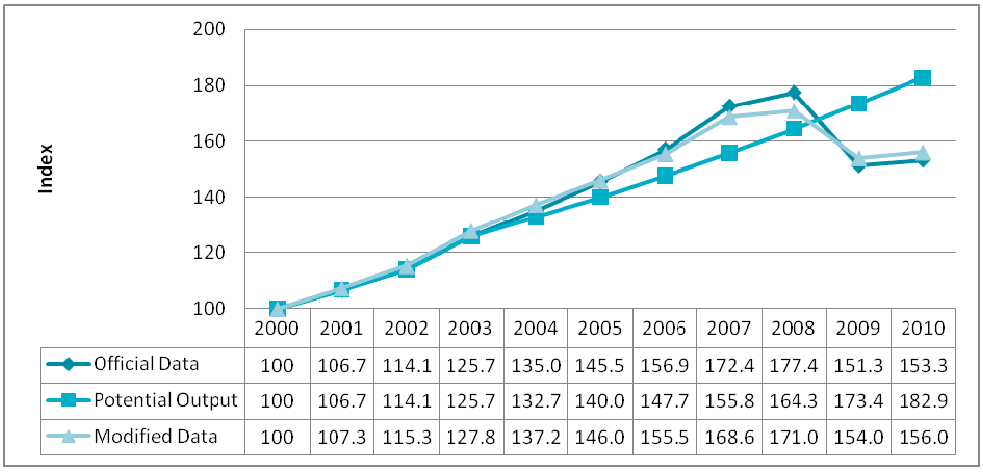


An atemt to use the same statistical technique and Eurostat date base as well as USA as a reference country USA GDP per capita equals 1, provides even less strong evidence (R^2 is just 0,0384) regarding the importance of convergency in assesment of economic growth in Europe.



Taking in to account relative weakness of convergence theory (R^2 is less then 0,2) we will use potential output approach for modelling of Lithuanian economic growth.

There have already been a number of calculations done to estimate the long term growth of the period. Ruskenaitė (2009) used univariate (Time trend, Hodrick-Prescott filter, and Unobserved Components) multivariate (production functions) econometric techniques to estimate the potential output real GDP growth in the period from 1997 to 2007 as 6,5 to 7,0%. Kuodis and Ramanauskas have estimated the potential growth in the economy from 2000 to 2007 to be between 5% and 5,5% (Kuodis, Ramanauskas 2009). IMF calculated the potential to grow from on average of 5,5% to 7% from 2000 to 2010, depending on the calculation technique (Ohnsorge, Obiora 2008). Annual growth of 5.5 percent had been used as a proxy for the period. Based on the modified income data, the long term growth is estimated to be around 5,3%, which can be used for forecasting future Lithuania's welfare in 2011-2020.



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Official Data	100	106.7	114.1	125.7	135.0	145.5	156.9	172.4	177.4	151.3	153.3
Potential Output	100	106.7	114.1	125.7	132.7	140.0	147.7	155.8	164.3	173.4	182.9
Modified Data	100	107.3	115.3	127.8	137.2	146.0	155.5	168.6	171.0	154.0	156.0

Figure 4. Lithuania's real and potential GDP growth (Index, 2000 = 100)
Source: Lithuanian Department of Statistics dadabase, authors calculations

The Statistical technique based on estimated potential output makes it clear that there was a bubble forming from 2004. 5 percent points higher 2007-2008 inflation than that of 2004-2005 level is further evidence of a bubble. GDP is recorded using both (developed by official statistics and modified) data series.

(Ruskenaitė 2009) calculations based on a Coub-Douglas function also bring strength to understanding the role of technological progress in Lithuania:

$$\ln\left(GDP^{Potential}\right) = -0{,}548 + 0{,}808\ln(A) + 0{,}875\ln(L) + 0{,}125\ln(K)$$

Where A represents technological progress, L is a number of people employed and K is accumulated capital. The equation points to large weights associated with productivity and labour and less to capital. In Lithuania labour actually deteriorated in the period of 1997-2007 at an average of 0,52% per year. Capital during the same period increased by 6,75% y-o-y, but the small weight meant that this contributed less than 1 percentage point towards GDP growth. The conclusion, then, is that the largest share of

growth came from Technological change, which accounted for over 90% of the growth. IMF calculations gave a more modest figure of 49% (Iradian 2007: 17). Calculations supports the idea that structural, technological change was the main driver for Lithuania's economy even without immense investment in to tangible assets.

10. Conclusions

Transition from "command" to "market" economy started in Lithuania and other states of Former Soviet Union in 1990. Radical reforms appeared to be a challenge not just for initiators and managers of reforms but for analysts as well. 20 years since the beginning of reforms researches are arguing about the depth of qualitative changes and precision in measuring outputs of market reforms.

The paper shows that targeted research is probably needed to adjust classical statistical methods to estimate dynamics of GDP to realities of economies in transition:

- The evidence suggests that figures in national accounts are likely to be underestimated during the initial transition period of 1990-1994 and market formation period (1995-2003). The growth would be 1,2% higher than reflected by official statistics if structural changes (decomposition of the shortage economy, increasing consumer choice and quality of goods and services, improvements in the terms of trade, a move to non- tradables and the shadow economy) are considered in Lithuania from 1990 to 2003.
- GDP growth was likely exaggerated during the "boom" of 2004-2007. Discounting of inflated profits (especially in real estate business) and public sector value added appeared to be most controversial.
- Alternative measures may be needed to account for recession of 2008-2009 and the recovery which started in 2010, as they too were subject to transitional phenomena (for example, a vivid shadow economy) that were largely omitted from official statistics.
- Modelling of economic growth according to convergence theory do provides relevant data but the strength of the tool is relatively weak (R^2 is less then 0,2).
- Based on the modified data, the annual potential growth in Lithuania during 2003-2010 is estimated to be around 5,3%.

The paper indicates that even if transition in Lithuania is not over yet (there is still potential to elevate market competition) trends observed in the second decade of reforms have much more in common with realities reflected by the routine contemporary statistics. The convergence of economic systems makes forecast of development based on econometric models applicable to OECD countries (model of potential economic output) quite reliable. One the other hand, research community has to be aware that final (hopefully) decade of transition may present some positive and negative surprises.

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RINKOS EKONOMIKOS SUSIDARYMAS LIETUVOJE 1990–2010 METAIS

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Santrauka. Užsienio literatūroje beveik neabejojama, kad Lietuva pažengusi į priekį privatizavimo, kainų liberalizavimo, atviros ekonomikos srityse. Kita vertus, oficialios statistikos duomenys rodo, kad šaliai nepavyksta pasiekti tvaraus ekonomikos augimo.

Straipsnyje apžvelgiama sudėtinga šiuolaikinė Lietuvos ekonomikos raida (tokie struktūriniai pokyčiai, kaip deficito ekonomikos persistruktūravimas, prekybos liberalizacijos poveikis, infliaciniai burbulai šešėlinėje ekonomikoje) ir nacionalinės apskaitos metodologija, iš dalies nesugebanti atspindėti šių pokyčių. Yra požymių, kad nacionalinė sąskaityba per žemai vertina Lietuvos bendrąjį vidaus produktą (BVP) per pradinį reformų laikotarpį 1989–1994 ir rinkos formavimosi laikotarpį 1994–2003, taip pat pervertina didėjimą 2004–2008 ir kritimą 2008–2009 metais.

Remiantis modifikuotais pajamų duomenimis, ilgalaikis augimas vertinamas 5,3 proc., jį galima naudoti prognozuojant būsimą Lietuvos gerovę.

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