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EFFICIENCY OF FINANCING LOCAL GOVERNMENT INVESTMENTS FROM EXTERNAL RESOURCES

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Abstract

The objective of the paper is to analyze level of efficiency and effectiveness in financing local investments from external resources and to suggest how both of them could be improved. We analyze methods of financing investments used by local governments and how the financial capacity of local governments in relation to economic and technical efficiency of financing local investments from external resources.

We develop two specially designed indicators of investment effectiveness and investment efficiency to measure economic and technical efficiency of financing local investments, and present examples of implementation of the developed indicators, for select local governments to demonstrate how these indicators function.

Statistical analysis shows that the developed indicators serve its function. Select recommendations regarding financing local investments from external resources are formulated to facilitate improvement in financial management by local governments.

1. INTRODUCTION

The objective of the paper is to analyze level of efficiency and effectiveness in financing local investments from external resources and to suggest how both of them could be improved.

We analyze methods of financing investments used by local governments and the financial capacity of local governments. We also study role of the central government grants in animating municipal capital market and the impact, the above issues have on the economic and technical efficiency of financing local investments from external resources, first of all from debt.

We include three areas of external financing: (1) municipal borrowing; (2) concessionary financing, and government grants for financing EU sponsored projects; (3) EU funds, which until 2007 have been considered external, and starting this year are included into both, local government budgets, and state budget.

However, application for E. U. funds is complicated and lengthy process. At the most, only half of applying local governments obtain the funds. Therefore, in our analysis, we consider the E. U. funds external.

Calculation of both, economic and technical efficiency of financing local investments for all three categories of external resources base on data of representative local governments (about 90 municipalities), which responded to a specially designed questionnaire. We have also included in the analysis, the influence of select concessionary financing instruments, on functioning of the municipal capital market in Poland. In addition, statistical data and information have been gathered from Ministry of Finance (Bitner, Cichocki, 2007). In this report we investigated bank loan pricing for incurring debt by local governments.

A discussion is presented regarding importance, of creditworthiness assessment and long – term financial and investment planning - for efficient timing of debt issue and for appropriate selection of a form of debt (bonds or credit) in the light of public finance law. *The periods in*

which cash flows resulting from borrowings appear should match time schedule of investment disbursement – to eliminate the risk of negative arbitrage. The external resources should be obtained efficiently - at the lowest possible true cost.

Two specially designed indicators of investment effectiveness and investment efficiency are developed to measure economic and technical efficiency of financing local investments.

We present examples of implementation of the developed indicators, for select local governments, to demonstrate how these indicators function.

Statistical analysis has been performed to show that the developed indicators serve its function.

Select recommendations regarding financing local investments from external resources are formulated to facilitate improvement in financial management by local governments.

2. POLISH LOCAL GOVERNMENT FINANCIAL SECTOR

2.1. Characteristics of the local government finance sector in Poland

The local government finance sector plays an important role in redistribution of the state revenue. Below, we highlight specific features of the local government finance sector. Its expenditure (see Figure 1) equals close to half of the state budget expenditure (including transfers and grants to local government sector). However, the local government (JST) investment expenditure (which in majority equals capital expenses) are twice as high as investment expenditure of the state budget (Figure 2).

Figure 1. Comparison of total expenditure of the state budget and of local governments
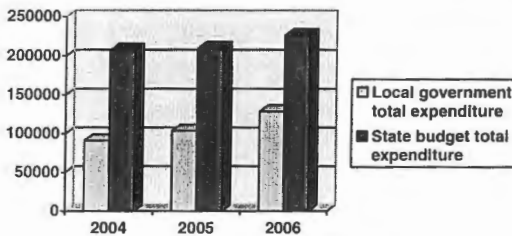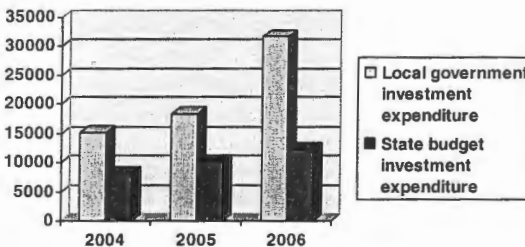

Figure 2. Comparison of investment expenditure of the state budget and of local governments


The largest investment are observed in cities with district (poviat) authority, as both cities and districts implement and assume responsibility for the majority of local tasks in such areas as municipal infrastructure, environment protection, transportation, communication and education and health care (see Figure3). The infrastructure tasks such as roads, sewerage

networks, waste water treatment and solid waste management and tasks associated with education prevail among local tasks.

Voivodships focus on investment regarding regional roads and health care, while small cities, towns and rural local governments (gminas) implement the same tasks as large cities, although at a smaller scale. They are large in numbers – about 65% of all local governments (excluding districts and voivodships) in Poland, but still the investment expenditure of an individual local rural government are nominally low.

Figure 3. Local government investment expenditure for various types of local government
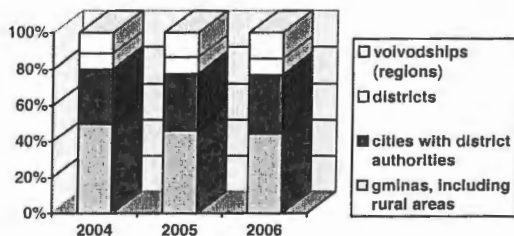
In 2006 The share of investment, which were co-financed from European funds, in total investment equals approximately 30% (Figure 4), and grew from a low level of 1% in 2004. The average level of co-financing, for all JST in 2006, equals 64%, while the remaining 36% are JST budget resources, including debt (see Figure 5).

Figure 4. Local government investment expenditures: total and those, co-financed with the EU funds
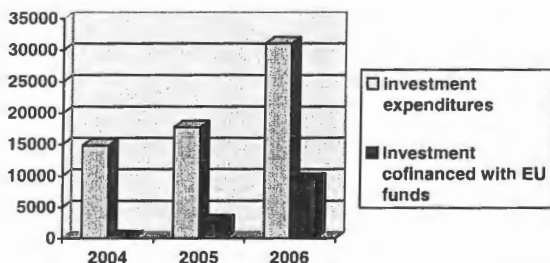
When we look at individual local governments, the level of investment expenditure co-financed from EU, as a share of total expenditure varies from very low levels, as for example for cities K1 and K2, in Figure 5, to relatively high and stable level (cities S2, S3). We can observe cities which investment grew very fast (city E1), or which experienced a strong change in consecutive years – city S1.

Figure 5. Local government investment expenditures co-financed from EU, as a percentage of total investment expenditure
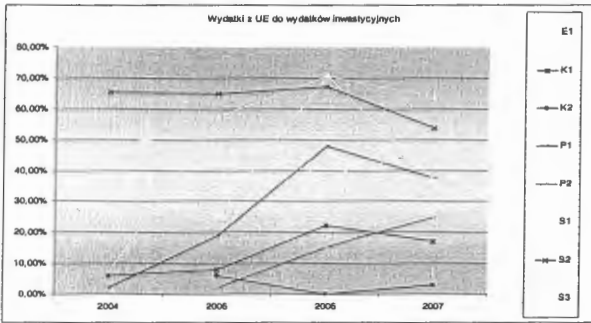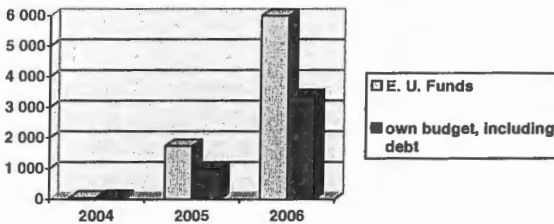
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Figure 6. Source of local investment financing: EU funds, and local government budgets

2.2. Financial flows in local government budget

In Poland, the sources of funds that flow into a municipality's (called gmina) budgets[1] are defined at various levels of detail by: the Constitution of the Republic of Poland, the Law on Public Finance, the Law on the Revenue of Local Governments, and the Local Self-Government Act. Expenditures borne by units of local government are defined by the Local Self-Government Act according to the specificity and the scope of their responsibilities (tasks). Revenue from loan proceeds, from sales of capital shares owned by gmina and from previous time budget surplus are considered non-revenue, and serve to finance budget deficit. Likewise, the expenditure does not include amounts allocated for the repayment of loan principal - they also make up proceeds. Over the period 2004-2006, there were legal und financial reporting inconsistencies regarding UE funds as a source of JST budget revenues. They were, in majority, clarified in the 2006 *law on public finances*, which included the UE funds into budget revenue.

In order to obtain an actual and undistorted picture of the financial status and quality of financial management in the JST, specifically management of external resources, one should base the analysis not exclusively on the revenue and expenditure, as it was defined in the law until second half of 2006. The analysis should include financial flows defined in the budget as non-revenues and non-expenditures, as well as the actual cash flows between the JST (gmina) and other entities.

For the purpose of analysis of effectiveness and efficiency we introduce notions of *gross* and *net* operating surplus, and real financial yield (net operating surplus on the current account).

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[1] Gminas, and other local governments (poviat and voividshios) are, in brief, called in the paper JST.

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Neither of these notions functioned in Polish regulations, nor in local government financial reporting, and only the 2006 *law on public finance* introduced the net operating surplus on the current account value, which we describe and discuss in chapter 3.

The *operating surplus* - revenues in excess of operating expenditures - can be used to fund capital expenditures and is not needed to fund operating expenditures. Thus, the available resources to fund capital public infrastructure projects and to service debt consist of the operating surplus (surplus current revenues and special grants), and the proceeds from borrowing (loans and bonds).

The net operating surplus is defined as operating surplus less costs of spending for service of the existing (and planned) debt - interest payments on short - and long-term debt, and JST guarantees of budgetary enterprise debt. The larger is the level of these resources the more available funds for financing investment. The available resources therefore represent a pool of funds JST have available to use for capital expenditures, or other purposes. JST should strive to allocate a consistent amount of these funds from year to year to meet their capital needs.

Often, municipalities are very ambitious - they start investment they can not afford, and which are not safe for their future budgets. They plan financing large (often needed) investment from debt, which later they can not repay (cost of debt service turns out to be higher than operating surplus). Then, a JST experiences "investment – indebtedness trap". As a result of too high investment and too high debt, the JST has to drastically decrease investment expenditures (and number of investment projects), often for several years, or even stop financing an uncompleted investment project.

Polish national *law on public finance* requires that at the end of each year t, in any single JST debt is limited, specifically:
(1). an amount of total debt outstanding (indebtedness) does not exceed 60% of total annual revenues
(2). the total debt service as a percentage of total annual revenues does not exceed 15%.
In many countries in western Europe and in the USA it is customary to issue debt, which is below 60 percent of total taxable municipality's revenue.

## 3. MEASUREMENT OF EFFECTIVENESS OF FINANCING LOCAL INVESTMENT

Local governments must be able to measure and evaluate their financial strengths (and weaknesses) in order to plan for and manage the delivery of services. Without adequate financial strength, the ability of governments to perform their essential functions is severely limited and may create costs for a large number of individuals and groups, if services are of poor quality, disrupted or delayed. In Poland, as in many other new member countries of EU, we observe a substantial infrastructure gap as compared to old member countries of EU. There are less local infrastructure facilities, their quality is worse and related services are of poorer quality. Therefore, the need for resources to invest in local infrastructure is very high.

3.1. Local investment financing

The JST investment expenditure, starting 2004, grew, both in nominal values and as a percentage of total expenditure – from 16, 2% in 2004, 17,1% in 2005, to 24,1 % in 2006. Over the period 1999 – 2003, the level of investment expenditure decreased from 19,1 in 1999, to 15,5% in 2003.

In Figure 7. we show a share of local government investment and operating expenditure in JST total expenditure, in percent. Operating expenditure are current expenses, which are not investment expenditure.

Figure 7. Local government investment expenditure and operating expenditure as a percentage of total expenditure
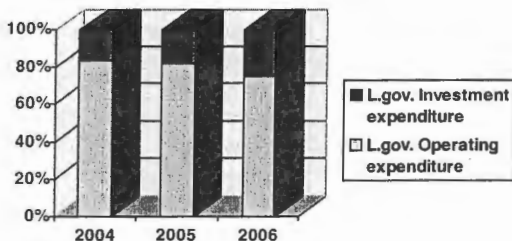
When we look at individual local governments, the level of investment expenditure, as a share of total expenditure varies from very low levels, as for example for cities C1 and P2, in Figure 8, to relatively high and stable level (city K1). We can observe cities which investment grew very fast (city R2), or which experienced a strong decrease in investment – city S2.

Figure 8. Local government investment expenditure as a percentage of total expenditure – for individual local governments
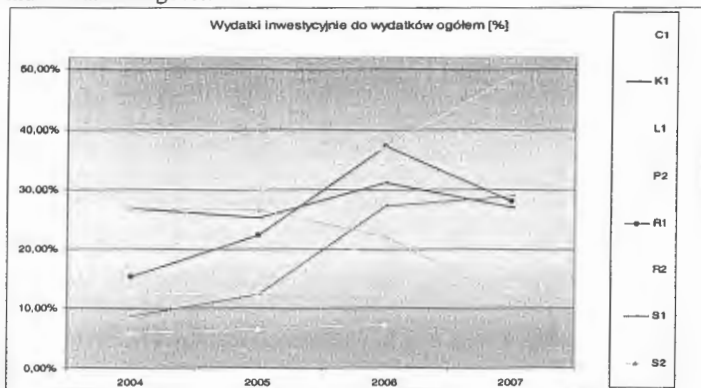
In this chapter we intend to develop an indicator for accessing ability of JST (a gmina) to acquire funds (from all available sources) for financing investment, and actually, utilize them for investment financing.

Additionally, we introduce an indicator for measuring efficiency of using the obtained resources. The first indicator is new, developed in 2007, the second is relatively new, not yet used, and it does not appear in official financial reporting, although it has been used by the author in his consulting activities (and by a few other financial specialists), for several years.

Both these indicators are relatively straightforward to calculate and provide a "snapshot" of a gmina's (JST) effectiveness. The second indicator provides some degree of efficiency in financing local investment (in fact, the both indicators roughly approximate the JST financial position). These indicators also permit some degree of inter-gmina (JST) comparisons.

The effectiveness indicator, defined in this chapter, follows the approach of "efficient management" financial indicators developed in (Cichocki, 2001and 2006,Cichocki, Leithe, 1999; and Cichocki, Bitner, Szpak, 2000).

Both indicators, of effectiveness and, of efficiency, have been verified using the JST data (from over 150 JST financial reports). We have also utilized the Municipal Data Base in the Ministry of Finance, and based on data received from local governments, which responded to a questionnaire, we have sent out to over 170 JST. They included all JST, which over 2004 - 2006 issued municipal bonds and used debt exceeding 1,5 million PLN, to finance investment projects, which were co financed with the E.U. funds. The analysis, together with implementation of a comprehensive indicator assessing efficiency of using debt is included in Bitner, Cichocki, Nam (2007).

3.2. The indicator of effectiveness of acquiring funds for financing local investment

The indicator is the result of combining the four following factors (partial indicators).

Partial Indicator 1.

fUE_t / Inv_t. *The share, in year t, of funds from UE* (fUE_t), *used for financing JST investment, in total JST investment expenditure (* $Inv_{t,}$*);*

The value of this indicator shows the rate of utilization of UE funds in financing local (a given JST) investment.
The larger is the value of this indicator, the higher is the share of UE funds in total investment expenditure. Then, more funds in a given JST budget is left for financing other local investment projects, for which financing UE money is not used. In short, the higher is the value of this indicator, the better for a given JST.

Partial Indicator 2.

flB_t / Inv_t. *The share, in year t, of funds from local government budget,* flB_t , *used for financing JST investment, in total JST investment expenditure (* Inv_t);

The value of this indicator shows the rate of utilization of JST budget funds in financing local (a given JST) investment. The JST budget funds include own revenue budgetary funds (user's fees and charges, shares in PIT and CIT, grants, revenue from property), state budget grants, and three categories of debt: commercial debt (credits and loans), municipal bonds, and concessionary loans (used for financing environment infrastructure), with interest rate lower than the market rate, and with a possibility of remission of part of the debt.

The larger is the value of this indicator, the higher is the share of local budget funds in total investment expenditure – the higher is the degree of various forms of state budget financing, including grants and concessionary loans, and possibly debt remissions. High value of this indicator means a large number of infrastructure investment projects financed and implemented.

Partial Indicator 3.

D_t/ Inv_t. *The share, in year t, of funds from debt,* D_t – credits, loans, and municipal bonds, *used for financing JST investment, in total JST investment expenditure (* Inv_t);

The debt D_t equals a part of a new debt ND_t , in year t, used for financing JST investment in the same year t. The debt D_t is an increase in the JST indebtedness in year t. The remaining part of new debt ND_t is used for repayment of the debt principal. We call it debt repayment and denote ReD_t . Thus,

(1) $D_t = ND_t - ReD_t$, $t = t_0, t_1, ..., t_N$;

where t_0 denotes a budgetary year, in which a JST budget is prepared for the next year, t_1. The year t_N is the last year of analysis, or of the long-term financial plan.

Indebtedness at the end of year t - Z_t equals indebtedness in the beginning of the year t - Z_{t-1}, plus the new debt ND_t, minus debt repayment ReD_t. Thus, we have

(2) $Z_t = Z_{t-1} + ND_t - ReD_t$, $t = t_0, t_1, ..., t_N$;

For $t = t_0$, we have: $Z_t = Z_{t0}$.

The larger is the value of this indicator, and its level remains safe for a given JST, the higher is the share of debt in total investment expenditure, and consequently, a larger number of infrastructure investment projects can be financed and implemented.

Long-term debt is debt issued for a period longer than one year, and generally issued for purposes of financing the construction or rehabilitation of large and expensive capital infrastructure. While there are economically sound reasons for issuing debt, its usage must be carefully monitored over time to be sure that a JST (gmina) does not assume more debt that it can afford to repay.

Debt is issued when other sources of revenue (additional user's charges, grants, revenue from property) can not be used. Debt resources add funds available for financing investment and can contribute to economic development of a municipality. Using debt for financing an investment project which will benefit future generations is seen appropriate by economists (Rosen, 1995, Stieglitz, 1998) and by politicians. In Poland, likewise in other countries common capital projects financed by debt include roads and bridges, sewage networks, waste water purification plants, landfills, hospitals and recreational facilities. However, debt should be used efficiently and in a safe way.

Safe debt should ensure JST budget liquidity in each year, and over a long-time period. It is related to the level of operating surplus – the available resources in JST budget, and to the level of annual *real financial yield* (ARFY) - an amount of funds which remain in the municipality's budget at the end of the fiscal year (surplus on the current budget – account, which must be positive). Safe debt depends also on the revenue structure and past debt commitments.

In general, surplus revenues must be left for financing investment, and operating surplus cannot in all be spent for debt service. When the combined total of projected debt service payments are very close to the value of operating surplus, then no new investment can be financed, usually, for a period longer than one year. The total debt service as a percentage of operating surplus - should be less than a given positive number, smaller than one. JST are usually well off when, over a long time period, the debt service is close to 50% of the operating surplus.

Most local governments must assume continuity of investment process and ensures that some, and in many cases substantial investment are financed every period.

In Figure 9 we show, for all local governments in Poland (JST) the share of budget operating surplus in financing local investment. We can see that in 2006 the investment expenditure are much higher than the operating surplus. This implies, that the investments were financed from debt. The increasing debt used for financing investment will accompany the development of local infrastructure and utilization of the E.U. funds over 2007 – 2013. Therefore, it is very important that the debt resources are used efficiently. A short analysis of efficiency in

financing investment is presented in 3.3., and an extensive study of debt efficiency is presented in Bitner, Cichocki, 2007.

Figure 9. Local government investment expenditures and budget operating surplus
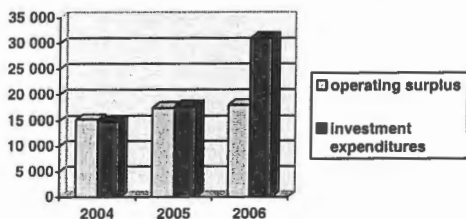
Partial Indicator 4.

Inv $_t$ **/ Exp** $_t$. *The share, in year t, of investment expenditure,* Inv $_t$, *in the total JST expenditure (* Exp $_t$);

The value of this indicator shows an investment effort of a given JST and represents the rate of utilization of both, the local budget funds and external funds in financing local investment. In a sense it represents a successfully implemented willingness to invest by a JST.

The external resources (included separately in partial indicators 1-3) appear in this indicator implicitly as sources of financing investment. The partial indicator 4 includes contribution of revenue from loan proceeds, from sales of capital shares owned by JST and from previous time budget surplus, which, by law, are considered non-revenue. Thus, the value of this indicator is the result of a planned budget deficit (or surplus), and in a sense shows the effectiveness of managing the operating expenditures. The higher are the investment expenditure (the larger is the value of this indicator), the higher is the level of utilization of external resources, and usually, the more rationally and effectively are managed the operating expenditure. Hence, the larger is number of infrastructure investment projects financed and implemented.

JST should strive to allocate a consistent amount of the operating surplus funds, from year to year, to meet their capital needs. Therefore, a good strategy for Poland is to first maximize, and then maintain. Therefore, it is recommended to establish a targeted percentage of total annual spending that will be devoted to capital infrastructure financing, and effectively seek for external resources.

It is true that in times of fiscal stress, it is easy to postpone making investments in capital infrastructure. While this may help a JST financial condition in the short-run, in the long-run it will increase the JST costs as a backlog of unmet needs accumulates and as obsolete equipment and facilities make service provision more inefficient.
The key to well informed and efficient **decisions regarding investment is the determination of a safe debt** for an individual JST. Simplifying a little, we can write that the level of investment is a sum of the net operating surplus and debt used for its financing:

(4) $\text{Inv}_t = \text{netSOp}_t + D_t$

Whenever, in every consecutive year, we can control debt, D_t, and keep it at a safe level, then the investments will also be controlled and not excessive.

We define the indicator of **investment effectiveness** in year t, – IInv $_{KSCMB\,t}$ (effectiveness of acquiring funds for financing local investment, or **intensity of investment**), as a product of the fourth indicator, and the summation of the three first partial indicators.

We emphasize the role of debt in financing local investment, as debt appears in the second and the third partial indicators. Thus, the investment effectiveness indicator is defined as the sum of shares of all external resources in investment expenditure, multiplied by a share of investment expenditure it total expenditure:

(5)   IInv $KSCMB_t$ = [fUE $_t$ / Inv $_t$ + flB $_t$ / Inv $_t$ + D $_t$ / Inv $_t$] x Inv $_t$ / Exp $_t$;

After multiplication, we obtain:

(6)   **IInv $_{KSCMB\,t}$ =   [fUE $_t$ + flB $_t$ + D $_t$]/ Exp $_t$**

The larger is the value of the effectiveness indicator, (6), and also the value of (5), the greater is the degree of utilization of external resources in financing local investment in a given JST (the higher is the debt, both commercial and concessionary, the higher are state budget grants), and consequently, a larger is the number of infrastructure investment projects financed and implemented. An increasing value of IInv $_{KSCMB\,t}$ leads to maximization of investment expenditure.

Since from equations (1) and (2) we have: D $_t$ = Z $_t$ - Z $_{t-1}$, then the investment effectiveness indicator **IInv $_{KSCMB\,t}$** – can rewritten as:

(7)   **IInv $_{KSCMB\,t}$ =   [fUE $_t$ + flB $_t$ + (Z $_t$ - Z $_{t-1}$)]/ Exp $_t$**

This form of investment effectiveness will be used for assessing the effectiveness of acquiring funds for financing local investment, as all data appearing in (7) can be found in local government financial reports.

The investment effectiveness indicator IInv $_{KSCMB\,t}$ assumes values in the range between 1,2 and –0,25, but the extreme border values occur very seldom in practice. The most often values are included between 0,2 and 0,6.

The values of the effectiveness indicator above 0,2 and increasing shows a growing potential and ability of a JST to acquire funds for financing investment. The recommended values of the indicator are between 0,4 and 0,6.

Negative values of the effectiveness indicator shows an unsatisfactory ability of a JST to acquire funds for financing investment.

Thus, the level of investment depends on financial potential and financial status of a JST and on the effectiveness in acquiring various types of external resources for financing investment, including the E.U. funds and debt (value of the indicator IInv $_{KSCMB}$. It also depends on efficiency of managing these resources - efficiency of financing local investment, which may be represented by JST budget liquidity.

3.3. An indicator of efficiency of external funds utilization in financing local investment

The condition for a JST budget liquidity in each year, and over a long-time period, for example minimum 10 years, is closely related to ensuring a safe debt in the JST, which in turn depends on the level of operating surplus – the available resources in JST budget. As a result of decisions regarding investment expenditures, we obtain an annual *real financial yield* (ARFY) - an amount of funds which physically remain in the municipality's budget at the end

of the fiscal year (see Cichocki, 2001 and 2006, and Bitner, Cichocki, Nam, 2007). Thus, on the one hand the debt should be coordinated with the operating surplus and ensure budget liquidity, on the other hand it should meet the investment needs.

The annual *real financial yield* determines an amount of funds which remain in the municipality's budget at the end of the fiscal year, and in current *law of public finance* is called surplus on the current budget – account. It equals *net* operating surplus less investment expenditures, plus newly borrowed funds.

The values of operating surplus to revenue, debt service to revenue and to operating surplus, and ARFY to revenue and to operating surplus help assess real financial situation of a municipality, ensure financial liquidity, and help determine a safe level of debt. *Each municipality has to determine a level of safe debt individually* (its nominal value and values of debt indicators [W2, W11 –see table in point 3.4. below] and debt service), based on the value of operating surplus to revenue indicator, the revenue structure and past debt commitments. Debt service in relation to total revenues is a measure of the burden of debt that has been assumed by a JST. Debt service is a fixed obligation that commits a JST resources for many years into the future.

Some municipalities do not make long-term financial plans, neither analyze long-term debt. These cities very often experience the debt - investment trap. They borrow too much and over-invest. As a result they have to drastically reduce investment expenditures, often for several years, reduce operating expenditures or even stop financing an uncompleted investment project. Other cities make arbitrary decisions regarding the level of debt and sometimes debt to revenue and debt to operating expenditure ratios. For example
some American cities require that net debt should not exceed 15% of per capita personal income (Aronson, Schwartz, ICMA, 1996), or 90 % of the amount authorized by law (Leonard, 1996). The debt is limited in the state of Missouri to 10% of the taxable fixed asset (Chesterfield, MO). The above values of cited indicators are very useful. But the cities do not know the real limits to their borrowing. Therefore, it is of great importance to prepare a long term (about ten years) finance and debt program, which ensures budget liquidity and efficient debt management.
Two high a debt incurs unnecessary costs of debt service. A high level of the surplus on the current budget account of a JST (ARFY) at the end of the fiscal year means that the issued debt was too high, and not adjusted to the current investment needs. Therefore, the value of ARFY must be appropriately low.

We define the surplus on the current budget account of a JST, at the end of the fiscal year t, (we call it the annual *real financial yield* - ARFY) as:

(8) $ARFY_t = Re_t - Exp_t + ND_t - ReD_t + ARFY_{t-1}$

where Re_t denotes total JST budget revenue, Exp_t denotes total JST budget expenditure, ND_t is the new debt in year t, and ReD_t - repayment of debt in the same year t.

The difference between total revenue and expenditure defines budget surplus SB_t at the end of the fiscal year t.

(9) $Re_t - Exp_t = SB_t$,

When total expenditures are higher than total revenue we observe budget deficit DeB_t, and equation (9) assumes the form:

(9A) $Exp_t - Re_t = DeB_t$, where in year t, DeB t > 0.

From equation (2) we have that: $ND_t - ReD_t = Z_t - Z_{t-1}$

Therefore, equation (8) can be re-written as:

(10) $ARFY_t = SB_t + Z_t - Z_{t-1} + ARFY_{t-1}$

Below, we define the condition for a individual JST budget liquidity, in consecutive years $t = t_0, t_1, ..., t_N$ of a long time period. This condition requires that the surplus on the current budget account ARFY is positive, greater than 0,5% of total revenue. At the same time the value of a ARFY must not be too high. It should not exceed the value of 2,5% of the JST total revenue. Cumulated resources at the end of each period (ARFY) are greater than 0,5% , and do not exceed 2,5% of the total budget revenue for small towns, and 3,5% for large cities.

(11) $0,005 < ARFY_t / Re_t = < 0,025$.

Thus, using relation (10) , we can write

(11A) $0,005 < SB_t / Re_t + Z_t / Re_t - Z_{t-1} / Re_t + ARFY_{t-1} / Re_t = < 0,025$.

This means that the value of newly issued debt ND_t and the level of indebtedness in year t must be closely correlated and must take into account the value of the surplus on the current budget account in the previous year t-1, for all years, until $t =. t_N$.

The conditions (11) and (11A) and the effectiveness indicator (7) have been jointly implemented to assess the effectiveness and efficiency of individual JST in financing their investment. The exemplary cases of external resources management in select JST (cities) are described in point 4. Using relations (7) and (11A), we can also compare individual JST.

We will observe the values of the effectiveness indicator $IInv_{KSCMB}$ in consecutive years 2004-2006, and a change in trend of these values, and check if the values of the surplus on the current budget account ARFY is above 0,5% and below 2,5% of the total budget revenue.

It often happens that local governments in its activity exhibit high effectiveness (high value of $IInv_{KSCMB}$, bur poor efficiency (too high value of ARFY) in financing investment. They loose a part of potential resources, which they acquired with such an effort and difficulties. City J, presented and described in chapter 4 may be a good example.

3.4. Statistical Analysis of the developed indicators

The indicators appearing in the formula defining the investment effectiveness indicator (7), and the annual *real financial yield* – ARFY to revenue (relation 11), as well as the indicator of indebtedness in relation to revenue and to expenditure were analysed statistically. The SPSS (Statistical Package for Social Sciences) program was implemented. partial indicators, and the(some measures of liquidity and of investment efficiency)
Correlations, with the Spearman method, between five major indicators - the investment effectiveness indicator $IInv^*_{KSCMB\ t}$, and the partial indicators, EU funds to investment expenditure, investment expenditure to total expenditure, and indebtedness, to total expenditure, as well as total external funds to total expenditure (W7 in table below) were analyzed over the period 2004-2006. In addition, for the same period, we investigate correlations between the values of the surplus on the current budget account ARFY to revenue,(W6), and the total external funds to total expenditure (W7 – see below), with both the Spearman method, and the Pearson method (looking for linear relations). The correlations

were investigated at two significance levels. Below, we once again define the above indicators, which appear in relation (5), (7) and (11).

Indicator	Data for consecutive years 2004, 2005, 2006, for 90 JST
W1: fUE_t / Inv_t	Funds from EU, for financing investment, to investment expenditure, in year t
W2: Z_t / Exp_t	Indebtedness, at the end of year t, to total expenditure in year t
W3: : Z_{t-1} / Exp_t	Indebtedness, at the end of year t-1, to total expenditure in year t
W4: $Z_t - Z_{t-1} / Exp_t$	An increase in indebtedness 9in year t, to total expenditure in year t
W5: Inv_t / Exp_t	Investment expenditure to total expenditure in year t
W6: $ARFY_t / Re_t$	The surplus on the current budget account to total revenue in year t
W7: $(fUE+flB)_t / Exp_t$	Funds from EU and local budget funds to total expenditure in year t
W8: $IInvKSCMB_t$	The investment effectiveness indicator in year t
W9: $flB)_t / Exp_t$	Funds from local budget only to total expenditure in year t
W11: Z_t / Re_t	Indebtedness, at the end of year t, to total revenue in year t

The results studied for 90 JST over 2004, 2005, 2006. are presented in Attachments 1 and 2. They can be summarized as follows. The value of the effectiveness indicator IInv $_{KSCMB}$ in 2005 is strongly correlated with the total external funds to total expenditure in 2005, but not with its value in 2004. IInv $_{KSCMB}$ in 2005 is also strongly (but weaker) correlated with the level of investment implemented in 2005, and with the level of funds from EU, acquired for financing investment in 2005. Its correlation with indebtedness is lower, both in 2005, and 2004, and there is practically no correlation with indebtedness in 2006.

The value of the effectiveness indicator in 2006 exhibits the same, but stronger, correlations with the above mentioned values. The correlation of funds from EU in 2004 is correlated with indebtedness only in 2006 (with a two years delay), and with the value of EU funds both in 2005 and 2006. The JST, which started the process of acquiring funds from EU, continue its effective efforts and , with success apply for these funds.

When analyzing correlations between the values of the total external funds to total expenditure (W7) and the surplus on the current budget account ARFY to revenue, (W6), we found a relatively weak correlation between W7 in 2004 and W6 in 2005, and 2006. However, the autocorrelation between W6, both in 2004, and 2005 was higher. The JST, which were not effective, continued their ineffective practices.

4. EXAMPLES OF IMPLEMENTATION OF EFFECTIVENESS AND EFFICIENCY INDICATORS

The investment effectiveness (7), investment efficiency (11) of financing investment, and partial indicators are intended to provide JST in Poland with a tool for assessing their financial condition with regard to intensity of acquiring funds for investment financing and efficient management of these funds. The information provided by these indicators can help a JST begin to assess its creditworthiness for borrowing, as well as identify areas of financial management, specially debt management, that need improvement. The developed financial indicators provide information about the JST overall financial position as measured by annual operating surpluses or deficits and total debt outstanding.

Moreover, JST, knowing and demonstrating strong financial condition, and its ability to acquire EU funds achieve better position to obtaining access to the credit markets for long-term financing. Banks and credit-rating agencies consider the strength of the local economy, as well as the specific nature and provisions of the local obligations and abilities.

We present three cities, and analyse their financial status, efficiency, and ability to acquire funds for financing investment, with the help of developed indicators.

City (Gmina) B:

Very low investment in 2004 (only 7% of total expenditure). Funds from EU and all local budget funds are very low and decreasing in 2006. Over 2004-2006, we observe a decreasing indebtedness in relation to both, the total revenue and total expenditure. The debt in 2004 was excessive - too high in relation to investment needs. Therefore, the surplus on the current budget account to total revenue in this year (value of W6) exceeds 4,8%. Its value decreases to below 2% in 2005.

The value of the investment effectiveness indicator $IInv*_{KSCMB}$ (W8) in 2005 and 2006 is negative, although this negative value is decreasing in 2006 (in 2006 $IInv*_{KSCMB}$ improved).

The investment expenditure to total expenditure (value of indicator W5) is increasing slowly, from a very low level of about 5% to 11% in 2005 and 22% in 2006. This was possible thanks to high (although excessive) debt in 2004, and high level of external resources in 2004 (from the state budget and E.U –W9). The debt was also managed efficiently in 2005 (decreasing value of W6), and in 2006 (we know this from complex debt management efficiency assessment, Bitner, Cichocki, Nam, 2007).
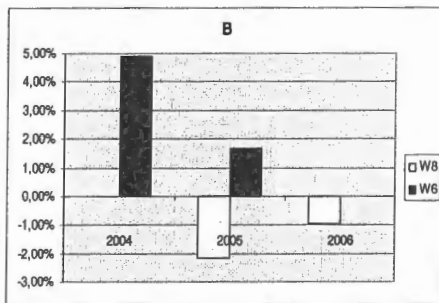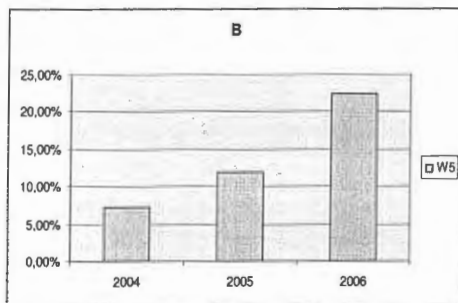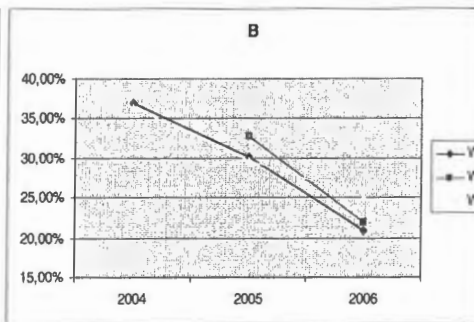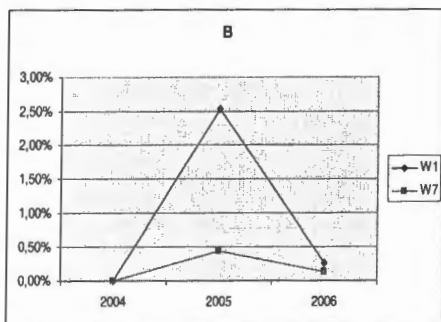
City (Gmina) K:

Increasing funds from EU and all local budget funds over 2004-2006 (to a very high level of 68% of the investment expenditure. Increasing indebtedness in relation to both, the total revenue and total expenditure – remains at low-medium level of 20%. The debt, both in 2004 and in 2005 was too high, not adjusted to the investment needs. Therefore, the surplus on the current budget account to total revenue (value of W6) exceeds 3,2% in 2004, and 3,7% in 2005. (is higher than the limit of 2,5% determined in relation 11).

The value of the investment effectiveness indicator, $IInv*_{KSCMB}$ (W8), increases in 2006 to a very high level of 60% - grows three times as compared to 2005. The investment expenditure

to total expenditure (value of indicator W5) is increasing fast, to a very high level of 53% in 2006 from a high level of 29% in 2005 (three fold), and a low level of about 13% in 2004. Investment effectiveness is very high in 2006, efficiency of financing investment – relatively low.
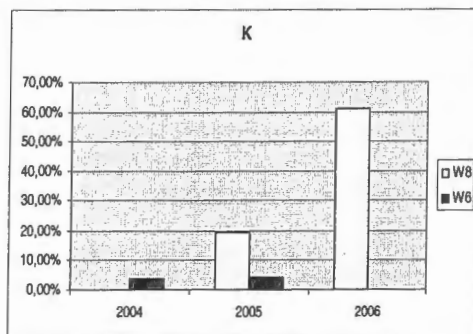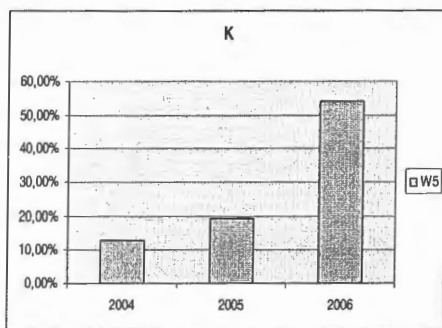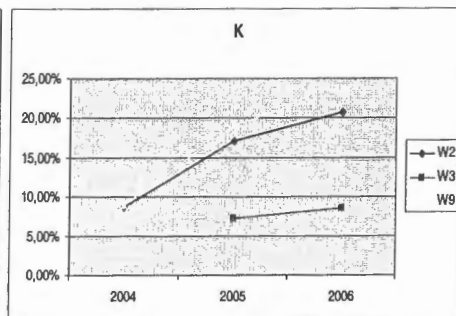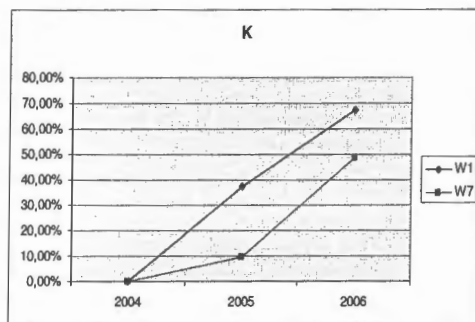
City (Gmina) J:

The situation in this city is, to some extent, similar to that of the city K, but city is not as effective as the city K in acquiring external funds, including debt. We observe increasing funds from EU (reaching high level of 59% in 2006) and increasing all local budget funds over 2004-2006, as a source of financing investment. However, the debt, although relatively stable is slightly decreasing in 2006 (the indebtedness in relation to total expenditure oscillates in the vicinity of 22%-24%, but the new debt decreases sharply). The debt, both in 2004 and in 2005 was too excessive.

The surplus on the current budget account to total revenue (value of W6) exceeds 6,2% in 2004, and in 2005 (is higher by a factor close to 3 than the limit of 2,5% determined in relation 11).

The value of the investment effectiveness indicator, IInv*$_{KSCMB}$ (value of W8), of acquiring external funds, increases in 2006 to a relatively high level of 35% - from a level of 17% in 2004. The investment expenditure to total expenditure (value of indicator W5) is increasing fast, to a high level of 40% in 2006 from already high level of 19% in 2005, and a low level of about 13% in 2004.

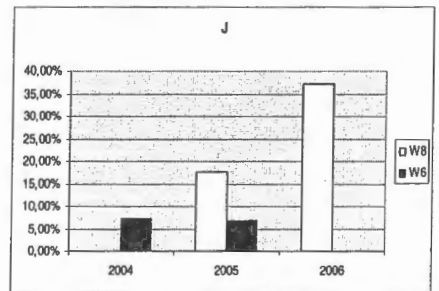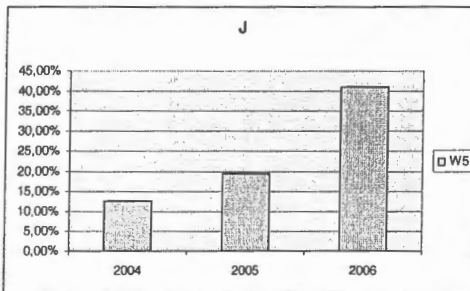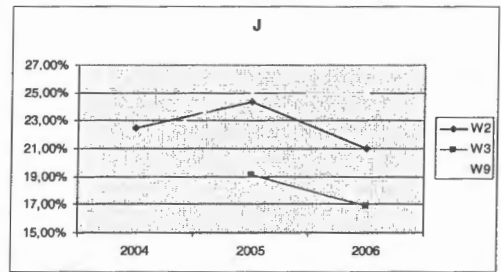Investment effectiveness is high, specially in 2006, efficiency of financing investment – of managing debt and finances is low, and does not improve.

15
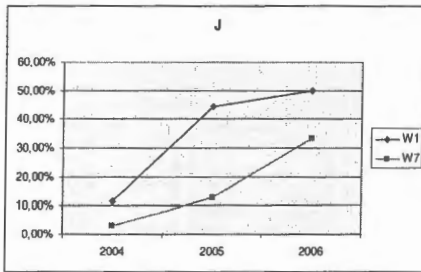
5. CONCLUSIONS

The developed indicators for measurement of effectiveness and efficiency in investment financing, and results of investigations, based on a representative group of 120 JST, which are presented in this paper and in Bitner, Cichocki, Nam, 2007, give evidence of low efficiency in debt and financial management of local governments in Poland.

The results also show, that the effectiveness investment financing, in case of many JST, decreased over 2004-2006.

The developed indicators measure known in literature economic efficiency, which implies raising external funds of appropriate volume and at appropriate time and technical efficiency means that external resources should be obtained at the lowest possible true cost.

The volume of borrowings should cover the gap between investment needs (identified in multi-year investment program of a local government) and capacity to provide financing from "above-the-line" budgetary resources. The periods in which cash flows resulting from borrowings appear should also match time schedule of investment disbursement. Thus, the risk of negative arbitrage is eliminated. One could say that economic efficiency will help evaluate whether residents preferences are reflected in local budgets. Technical efficiency is a measure of delivering public services at a lowest unit cost. Both notions of efficiency emphasize the importance of timing new debt issue, and are included in the presented indicators.

The findings regarding low effectiveness and efficiency in investment financing are a warning sign to local governments. The need for external resources, specially for debt, will remain very high over 2007-2013, the period, in which Poland will have to provide about 11,6 billion Euro to utilize EU funds anticipated for financing Polish infrastructure over this period. Half of these funds have to be provided by local governments, and the JST will, to a large extent, utilize debt. Presently, the cost of issuing debt is low, and there is little variation regarding

cost of credit and of issuing municipal bond. Below, we present a very flat curve, which shows the cost of issuing debt and taking credit.
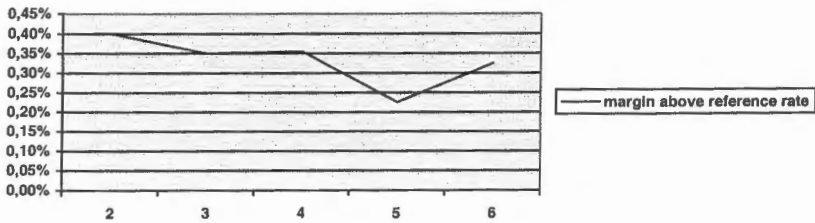
However, this situation may soon change, the over-liquid banking sector, with a single bank (PKO BP) assuming the role of a leader (monopolist on the market), will in a couple of years become less liquid. The cost of issuing debt will become much higher to JST, and then, efficiency of debt management, and effectiveness and efficiency in investment financing - management of external resources will become of vital importance.

In the years to come the winning JST will be those, which will be both effective and efficient in investment financing.
In order to be successful, the JST will have to:
- Develop long-term Financial Plans, with operating elements of long-term debt management
- Develop long-term Investment Plans, coordinated with the Financial Plans.
- Standards should be developed for preparation of long-term Financial and Investment Plans

In both these plans the operating surplus, the value of the total amount of the planned and the existing debt outstanding (and anticipated debt service), and the surplus on the current budget account, for each year should be measured and well designed. The developed indicators could help establish standards for "good" long-term Financial and Investment Plans.

- The issued debt (credit and bond) should base on effective true real costs, and should be coordinated with the long-term plans and budget liquidity.
- Rating should become more popular among local governments, and should make an access to capital market easier.

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Attachment 1.

Correlations

			W104	W204	W105	W205	W106	W206	W504	W505	W506	W704	W705	W706	W805	W806
Spearman's rho	W104	Correlation Coefficient	1,000	,800	,400	,600	,200	,900*	-,700	-,500	-,400	,000	,000	,400	,100	,000
		Sig. (2-tailed)	.	,104	,800	,285	,747	,037	,188	,391	,505	1,000	1,000	,505	,873	1,000
		N	5	5	4	5	5	5	5	5	5	4	5	5	5	5
	W204	Correlation Coefficient	,800	1,000	-,019	,765**	-,224*	,535**	,257*	,155	,033	,156	-,002	-,178	-,019	-,188
		Sig. (2-tailed)	,104	.	,882	,000	,039	,000	,015	,151	,760	,594	,989	,102	,862	,079
		N	5	88	66	87	85	88	88	88	88	14	75	85	88	88
	W105	Correlation Coefficient	,400	-,019	1,000	,288*	,425**	,248*	-,012	,486**	,094	,291	,911**	,372**	,759**	,212
		Sig. (2-tailed)	,600	,882	.	,020	,000	,045	,926	,000	,455	,385	,000	,002	,000	,087
		N	4	66	66	65	65	66	66	66	66	11	66	65	66	66
	W205	Correlation Coefficient	,600	,765**	,288*	1,000	-,107	,796**	,232*	,347**	,047	,081	,286*	-,088	,464**	-,114
		Sig. (2-tailed)	,285	,000	,020	.	,333	,000	,031	,001	,668	,782	,013	,425	,000	,293
		N	5	87	65	87	84	87	87	87	87	14	74	84	87	87
	W106	Correlation Coefficient	,200	-,224*	,425**	-,107	1,000	,059	-,010	,097	,422**	,484	,270*	,837**	,163	,777**
		Sig. (2-tailed)	,747	,039	,000	,333	.	,589	,927	,378	,000	,094	,022	,000	,137	,000
		N	5	85	65	84	85	85	85	85	85	13	72	85	85	85
	W206	Correlation Coefficient	,900*	,535**	,248*	,796**	,059	1,000	,186	,321**	,226*	,156	,295*	,119	,456**	,217*
		Sig. (2-tailed)	,037	,000	,045	,000	,589	.	,084	,002	,034	,594	,010	,277	,000	,042
		N	5	88	66	87	85	88	88	88	88	14	75	85	88	88
	W504	Correlation Coefficient	-,700	,257*	-,012	,232*	-,010	,186	1,000	,472**	,473**	,059	,203	,255*	,013	,237*
		Sig. (2-tailed)	,188	,015	,926	,031	,927	,084	.	,000	,000	,840	,081	,019	,905	,026
		N	5	88	66	87	85	88	88	88	88	14	75	85	88	88
	W505	Correlation Coefficient	-,500	,155	,486**	,347**	,097	,321**	,472**	1,000	,437**	,081	,697**	,305*	,667**	,215*
		Sig. (2-tailed)	,391	,151	,000	,001	,378	,002	,000	.	,000	,782	,000	,005	,000	,044
		N	5	88	66	87	85	88	88	88	88	14	75	85	88	88
	W506	Correlation Coefficient	-,400	,033	,094	,047	,422**	,226*	,473**	,437**	1,000	,112	,182	,773**	,105	,764**
		Sig. (2-tailed)	,505	,760	,455	,668	,000	,034	,000	,000	.	,703	,117	,000	,332	,000
		N	5	88	66	87	85	88	88	88	88	14	75	85	88	88
	W704	Correlation Coefficient	,000	,156	,291	,081	,484	,156	,059	,081	,112	1,000	,336	,418	,051	,218
		Sig. (2-tailed)	1,000	,594	,385	,782	,094	,594	,840	,782	,703	.	,286	,156	,864	,455
		N	5	14	11	14	13	14	14	14	14	14	12	13	14	14
	W705	Correlation Coefficient	,000	-,002	,911**	,286*	,270*	,295*	,203	,697**	,182	,336	1,000	,344**	,818**	,233*
		Sig. (2-tailed)	1,000	,989	,000	,013	,022	,010	,081	,000	,117	,286	.	,003	,000	,044
		N	4	75	66	74	72	75	75	75	75	12	75	72	75	75
	W706	Correlation Coefficient	,400	-,178	,372**	-,088	,837**	,119	,255*	,305*	,773**	,418	,344**	1,000	,185	,944**
		Sig. (2-tailed)	,505	,102	,002	,425	,000	,277	,019	,005	,000	,156	,003	.	,091	,000
		N	5	85	65	84	85	85	85	85	85	13	72	85	85	85
	W805	Correlation Coefficient	,100	-,019	,759**	,464**	,163	,456**	,013	,667**	,105	,051	,818**	,185	1,000	,094
		Sig. (2-tailed)	,873	,862	,000	,000	,137	,000	,905	,000	,332	,864	,000	,091	.	,385
		N	5	88	66	87	85	88	88	88	88	14	75	85	88	88
	W806	Correlation Coefficient	,000	-,188	,212	-,114	,777**	,217*	,237*	,215*	,764**	,218	,233*	,944**	,094	1,000
		Sig. (2-tailed)	1,000	,079	,087	,293	,000	,042	,026	,044	,000	,455	,044	,000	,385	.
		N	5	88	66	87	85	88	88	88	88	14	75	85	88	88

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Attachment 2.

Correlations

			W704	W705	W706	W604	W605
Spearman's rho	W704	Correlation Coefficient	1,000	,336	,418	-,224	,564
		Sig. (2-tailed)	.	,286	,156	,533	,090
		N	14	12	13	10	10
	W705	Correlation Coefficient	,336	1,000	,344**	-,060	,244
		Sig. (2-tailed)	,286	.	,003	,661	,082
		N	12	75	72	56	52
	W706	Correlation Coefficient	,418	,344**	1,000	-,059	,024
		Sig. (2-tailed)	,156	,003	.	,646	,861
		N	13	72	85	63	56
	W604	Correlation Coefficient	-,224	-,060	-,059	1,000	,371**
		Sig. (2-tailed)	,533	,661	,646	.	,006
		N	10	56	63	65	54
	W605	Correlation Coefficient	,564	,244	,024	,371**	1,000
		Sig. (2-tailed)	,090	,082	,861	,006	.
		N	10	52	56	54	59

**. Correlation is significant at the 0.01 level (2-tailed).

Correlations

		W704	W705	W706	W604	W605
W704	Pearson Correlation	1	,207	,391	,184	,491
	Sig. (2-tailed)	.	,519	,186	,610	,150
	N	14	12	13	10	10
W705	Pearson Correlation	,207	1	,415**	-,139	,138
	Sig. (2-tailed)	,519	.	,000	,307	,329
	N	12	75	72	56	52
W706	Pearson Correlation	,391	,415**	1	-,064	,024
	Sig. (2-tailed)	,186	,000	.	,619	,859
	N	13	72	85	63	56
W604	Pearson Correlation	,184	-,139	-,064	1	,333*
	Sig. (2-tailed)	,610	,307	,619	.	,014
	N	10	56	63	65	54
W605	Pearson Correlation	,491	,138	,024	,333*	1
	Sig. (2-tailed)	,150	,329	,859	,014	.
	N	10	52	56	54	59

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

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eszjkZakopane2008.dvi	PCTeX DVI Do...	2007-12-11 20:57	48 928	60%	19 694	
eszjkZakopane2008.aux	Plik AUX	2007-12-11 20:57	4 704	74%	1 220	
eszjkZakopane2008.BAK	Plik BAK	2007-12-11 17:28	41 510	66%	13 985	
llncs.cls	Plik CLS	2007-12-11 12:31	42 406	75%	10 414	
eszjkZakopane2008.tex	WinShellTexFile	2007-12-11 20:51	41 496	66%	13 973	
7 file(s)			345 892	40%	208 653	