

## **ON THE ROLE OF WAGES IN THE UKRAINIAN TRANSITION PROCESS : AN EMPIRICAL INVESTIGATION**

**by Gioacchino Fazio and Olivier Hueber\***

### **Summary**

There are two intriguing questions about the transition process undertaken by the Ukraine since its declaration of sovereignty in December 1991. (i) Why had one of the more prosperous republics of the former USSR in terms of economic development and population welfare been suffering of both a persistent and high inflation during the four first years of its young existence ? (ii) How - in the early months of 1996 - could the Ukrainian efficiently put an end to the skyrocketing of prices ?

The aim of this paper is to understand how such an outstanding reversal of situation could occur. Firstly, in support of a cointegration test, we assert that between January 1992 and November 1995, the Ukraine was faced with a complex monetary regime in which wage was the economic variable through which most of the inflationary pressures passed, directly or indirectly. Secondly, we explain that since the beginning of 1996, the existent monetary regime has been replaced by a new one in which inflation is contained but wages and pensions arrears increase quickly. Such a situation is not sustainable in the short and we outline possible remedies.

**Keywords :** Cointegration, monetary regime, inflation, Ukraine, wages.

---

\* LATAPSES - IDÉFI (CNRS)

## Introduction

Since the breakdown of the Soviet Union in December 1991, the fifteen constituent republics have begun to implement market-oriented reform programs. The Ukraine, a big country of 52 million people and endowed of a highly developed industrial sector had been suffering during four years from a very high monthly inflation rate. In fact, the Ukraine had the worst inflation record of any newly independent state<sup>1</sup>. Contrary to all expectations, from the beginning of the year 1996, the Ukrainian government succeeded in containing the high inflationary pressures. At the present time, the Ukrainian currency, namely the Hryvnya, is as stable as most of currencies managed by OECD countries.

The main goal of this paper is to reply to the following question: Is this new situation of monetary stability enjoyed by the Ukraine can last in the short/long term? In the aim of answering to such a question we adopt and evolve an institutional lecture of the high inflationary pressures which threatened and delayed the success of the market oriented reform program elaborated jointly by the IMF and the Ukrainian government since the starting of the transition process. The institutional feature of this approach lies in the complexity emerging of any economic system faced with galloping inflation. The dynamic structures of an high inflationary economy evolve to a complexity beyond human cognitive capabilities. For instance, for any Ukrainian private and public agents, it was in 1993 completely impossible to forecast with a relative good degree of accuracy the forthcoming monthly consumer price index. The inflation was admittedly high but above all extremely unstable<sup>2</sup>. In such a chaotic situation Ukrainian economic agents had to find simplifying strategies that did not oblige them to be faced with the full complexity of the system. It is possible to focus on these simplifying strategies adopted by individuals in this country during the high inflationary period and conceive them as institutional arrangements intended to avoid the complexity of the environment. The combination of these institutional arrangements shapes a monetary regime in which the co-ordination of the economic activities takes place. The study of the mains co-ordination mechanisms is therefore a prerequisite for detecting the current monetary regime. Such a lecture taking into account, the structure of this paper falls into two parts. Part one shed light on the high inflationary monetary regime occurred in the Ukraine for nearly four Years. This approach - supported by a statistical test -permits to define the main aspects of the high inflation in this country. Then, part two presents the current non-inflationary monetary regime and study its reliability.

---

<sup>1</sup> See Havrylyshyn, Miller and Perraudin 1994.

<sup>2</sup> For instance, the Ukrainian consumer price index (CPI) in summer 1994 : 79% in June, 21% in July, 22% in August, 80% in September.

## 1. On the process of inflation (1992-1996)

From 1992 to 1996, the Ukrainian economy faced with a dramatic depreciation of its currency - at this time the “Karbovanets”<sup>3</sup>. Such an high inflation provoked numerous disruptions in the co-ordination of the economic activities. Many privatisation projects failed and various investment decisions were postponed. Concerning the Ukrainian case, the high inflationary period cannot be understood apart from a study of the co-ordination of economic activities. The idea that inflation operates a structural change in the coordination of economic activities is quite old. In this respect, David Ricardo mentioned that inflation provokes «a violent and unjust transfer of property». In the Ukraine, the change in income distribution was one of the main result and drawback of inflation. As we will explain below, several social classes (for example, managers of public firms) took benefit of the fast depreciation of the Karbovanets while others (public employees or retired persons) endured a drastic reduction of their revenues. As a general rule, the observation of high inflation episodes experienced by most of the formally planned economies of Eastern Europe teaches us that inflation is a complex diffusion process that modifies the coordination of economic activities.

### 1. 1. *Facts and explanations*

From the early months on 1992, three main aspects characterised the coordination of the activities in the Ukraine namely, (a) the inheritance of the markets structures, (b) the attractiveness of the US Dollar and (c) the pressures proceeding from the International Monetary Fund. These three characteristics shaped a complex monetary regime driven by the requirement of wages financing.

Between 1992 and 1996, the market structure (a) in the Ukraine did not change a lot compared with the socialist times. In such a context, the economic links between firms established in the former era were persisting. Even nowadays more than 50 % of the Ukrainian industrial sector is still directly or indirectly state-owned. Moreover, sectors remaining under state control are the most vital for the economy (energy, metallurgy, mining, transport). Therefore, the market structure was extremely vertically integrated and consequently highly monopolistic. The second characteristic concerns the attractiveness of the US Dollar (b). At extremely high rates of inflation, several markets are “Dollarized”. For specific markets (for example real estate), economic agents must be in the position to fix a price which can be maintained during some length of time. Some markets have to be transacted in a stable currency. But, from David Hume works, it can be taken for granted that

---

<sup>3</sup> The inflation was so high that a good quoting 100 Karbovanets in January 1992 was priced at 641 420 Karbovanets in January 1996.

the only way to import a foreign currency is to export some national goods or services. All the economic agents are seeking the Dollar. Among these agents, it is very interesting to have a look at the attitude of the managers of the public enterprises. The managers do not have strong incentives to cover their costs and especially to pay the wages of their employees<sup>4</sup>. For a large number of them, the main purpose lies in accumulating US Dollars. Insuring the profitability of their enterprise in the aim of paying the wages is secondary. As a part of the public sector, the managers know that the government is eventually forced to pay the wages by granting some new credit lines and consequently issuing fresh money. On the contrary, the manager of a state-owned enterprise is tempted to export his production and, to reach this goal, he is ready to sell his goods or services at a loss. With the dollar, the manager can pay both himself and influent politicians to be quiet and continue his own business. Thus, a large number of public firms are in a situation of perpetual deficit and to avoid a socially unacceptable situation, the government must finance the wages.

The Ukrainian government was incapable of stopping the financing of the unpaid wages by issuing fresh money. At first sight, such an economic policy could have been a real solution to win the war against high inflation. Unfortunately, the Ukrainian government was “caught like a rat in a trap”. Stopping brutally the monetization of deficits would have provoked automatically the failure of numerous firms and consequently would have increased the unemployment rate. Moreover, such an economic policy was inapplicable regarding the market structure at work in the Ukrainian economy. As we noticed above (a), the economic interdependencies between firms of the same sector which had been established in the former socialist period were - and still are for a large part - at work. In such a context, the production of one entire sector could have been paralysed by the failure of one firm and especially if this firm was located upstream of the production process. Therefore, an economic policy of that kind would have provoked not only the bankruptcy of the insolvent enterprises but also the failure of the solvent ones.

Lastly, the third characteristic shaping the Ukrainian monetary regime between 1992 and 1996 lies in the pressures proceeding from the international organisation and especially from the IMF (c). To receive the help of the IMF, the monetary authorities of Ukraine have to show that they fight vigorously against high inflation.

To bring the IMF to the notice of its determination, the government of this country sometimes provokes a temporarily fall of the inflation rates.

---

<sup>4</sup> Officially, the enterprise law states that wages are set by joint worker-management commissions. The government, in consultation with trade unions, sets wages in each industrial sector. Wages in the state sector are controlled.

The economic mechanism at work is elementary, the government just decides to postpone the payment of wages for a couple of months. If there is no money, there is no inflation. Obviously, a such economic policy is not sustainable in the long term.

The Ukrainian economic authorities adopted, in a certain way, a rational behaviour. The range of it's alternative choices was very small considering the three major characteristics discussed previously. Moreover, in such a chaotic economic situation and beyond the major characteristics, several other parameters had to be taken into account by the government. For instance, the seed and harvest period constituted one of these additional parameters. The weight of agriculture was - and still is - great and this sector contributed up to 28,7% of the Ukrainian GNP in 1993. In January (seed period) and during the end of summer (crop period), the wages of the employees in public farms had to be paid. In these periods the government cannot postpone this payment.

Among the three characteristics listed above, during this period, wage was the economic variable through which most of the imbalances of the Ukrainian economy passed, directly or indirectly. As Heymann and Leijonhufvud (1995) pointed out that "*Yet the channels which transform monetary impulses in price changes are neither simple nor direct*". Many features of the Ukrainian inflationary process have to be taken into account but we assert that the payment of wages was from 1992 to 1996 the stumbling block of the complex Ukrainian monetary regime. The aim of the two following cointegrating analyses is to support such an assertion.

## 1.2. Empirical evidence

According to the descriptive evidence presented above, it is not surprising to notice that during 47 months - from January 1992 to November 1995 - both inflation and wages rates were highly correlated (see graph 1). Such a correlation is graphically observable, but to check the veracity of our definition of the Ukrainian monetary regime, we must set-up the econometric tests.

By observing the following graph, we can notice that numerous shocks characterised the recent Ukrainian high inflationary process. The main shocks which worsened significantly inflationary pressures are the following : the exit of the Ukraine from the ruble zone in November 1992, the rising of energy costs in April 1993, the sudden wave of retail prices liberalisation from May to July 1993 and the radical program of macroeconomic stabilisation and structural reform implemented in October 1994<sup>5</sup>. Obviously these shocks modified the inflation trend. Nevertheless,

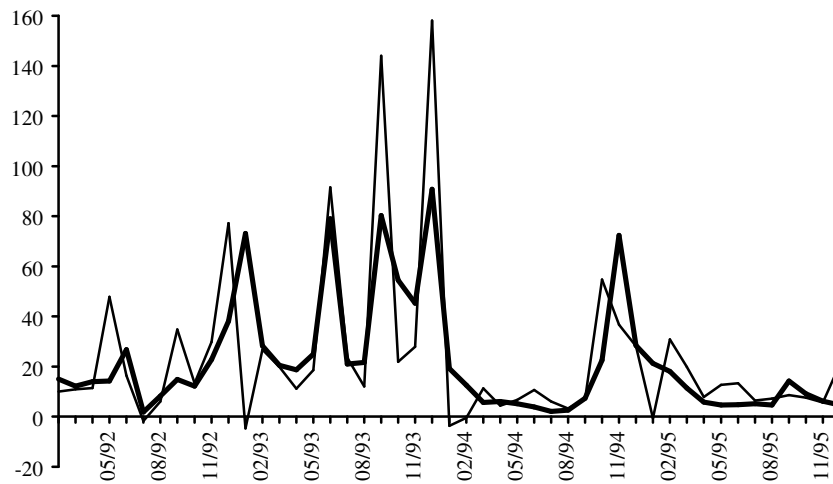
---

<sup>5</sup> In the closing months of 1994, most price controls were removed at once, except on some foodstuffs and communal services. Interest rates were raised, and banking system credit strictly curtailed.

they did not affect the tight relation we focus on, namely the relation between the payment of wages and the prices.

**Graph 1 : Evolution of Inflation and Wages**

— =  $\Delta$  Wages (in percent per month)  
 — = Inflation (in percent per month)



Monthly data used correspond to non-seasonally adjusted form and are drawn from two different sources, namely : IMF and Ukrainian Economic Trends<sup>6</sup>. Variables used concern the evolution in percent per month of both the logarithm of consumer price index (CPI) and the logarithm of average nominal wage (W) (January 1992 = 100). The CPI is a Laspeyres index based on household consumption shares of the previous year. The services in this basket include consumer services like housing rents and transport fares.

The prices which are used to build this index include taxes. The average nominal wage is the total of the accounted wage fund (for the whole economy or for a sector) divided by the number of registered wage earners. In such a vertically integrated

<sup>6</sup> IMF World Economic Outlook, May 1994, Chapter 5; IMF Staff Country Report No. 96/21 "Ukraine - Recent Economic Developments"; Ukrainian Economic Trends, Monthly Update and Quarterly supplement.

market structure (a) in which the most important industries are state-owned, the entire private and public wages - and not only public - were concerned.

Our starting point is the two steps procedure proposed by Engle and Granger (1987) which is specially well-suited to break down the dynamics of non-stationary series.

In fact, a formal unit root test does not reject the unit root restriction for CPI and W, whether in the series with or without trend (also if the trend results significantly in both):

CPI	DF(46,1)	ADF(1)	ADF(2)	ADF(3)
<b>with trend <math>\tau_\tau</math></b>	<b>0.207</b>	<b>- 0.989</b>	<b>- 1.076</b>	<b>- 1.538</b>
( <i>P</i> -value)	(0.994)	(0.944)	(0.932)	(0.826)
DW <i>d</i>	1.047	2.093	2.045	1.921
DW <i>h</i>		-0.584	-1.526	0.919
<b>without trend <math>\tau_\mu</math></b>	<b>- 1.459</b>	<b>- 1.25</b>	<b>- 1.384</b>	<b>- 1.415</b>
( <i>P</i> -value)	(0.851)	(0.903)	(0.881)	(0.863)
DW <i>d</i>	1.031	2.053	2.026	1.930
DW <i>h</i>		-0.495	-1.107	1.338

W	DF(46,1)	ADF(1)	ADF(2)	ADF(3)
<b>with trend <math>\tau_\tau</math></b>	<b>- 0.821</b>	<b>- 0.724</b>	<b>- 0.522</b>	<b>- 1.564</b>
( <i>P</i> -value)	(0.962)	(0.969)	(0.980)	(0.818)
DW <i>d</i>	1.988	2.005	1.948	1.888
DW <i>h</i>	0.058	-0.385	3.375	0.294
<b>without trend <math>\tau_\mu</math></b>	<b>- 1.147</b>	<b>- 1.284</b>	<b>- 1.45</b>	<b>- 1.560</b>
( <i>P</i> -value)	(0.923)	(0.896)	0.854	0.819
DW <i>d</i>	2.059	2.015	1.938	1.837
DW <i>h</i>		-0.522	3.077	0.801

Even, the second unit root test for CPI and W (with trend) confirm that W and CPI  $\sim I(1)$ :

CPI: DF = - 3.897 (*P*-value of 0.019) ;

W: DF = - 6,797 (*P*-value of 0.000) ;

It is conditional on the fact that each component series is  $I(1)$ , therefore we regress CPI on a constant and W (and the contrary) to obtain the cointegrating vector (standard errors are given in parentheses)<sup>7</sup> :

$$\text{CPI}_t = -0.149 + 1.023 W_t \quad R^2 = 0.997$$

<sup>7</sup> Given that Engle and Granger statistic is affected by choice of left hand variable, we put W on the left hand of this regression (as suggested by J.G.MacKinnon, 1990), the corresponding value of the statistic is identical.

[0.076]
[0.780]  
*t*-stat   - 1,968      131,213

So, the elasticity of CPI to W in long term is unitary. This result is moreover validated on the real wages that are stationary.

Testing for stationarity of residuals of this cointegrating regression by Cointegrating Regression Durbin-Watson and Dickey-Fuller statistics indicate signs of cointegration among the variables and no signs of misspecification<sup>8</sup> in this model<sup>9</sup>:

CRDW = 1.027  
 DF = - 3.916 [with a *P*-value of 0.017]

To close the model, we need to specify the dynamic general form with an error correction mechanism (ECM):

$$\Delta \text{CPI} = c + \Delta W + \Delta W_{t-1} + \Delta W_{t-2} + \Delta \text{CPI}_{t-1} + \Delta \text{CPI}_{t-2} + \text{ECM}_{t-1}$$

Eliminating non significant variables, we obtain the final specification<sup>10</sup>:

$\Delta \text{CPI}_t$	coeff.	<i>t</i> -stat.	<i>P</i> -value
$\Delta W_t$	0.611	9.572	0.000
$\Delta W_{t-1}$	0.209	3.003	0.005
$\Delta \text{CPI}_{t-2}$	0.283	3.344	0.002
$\text{ECM}_{t-1}$	- 0.318	- 3.054	0.004

The result is therefore, that inflation can not be explained only from the variation on the current wages and the preceding one and also from the same variation in consumer index price of the past, but also the imbalance between levels of inflation and previous wages.

In fact, the coefficient - 0.318 explains the velocity with which in a short period, CPI and W adjusts themselves to the preceding imbalance ( $\text{ECM}_{t-1}$ ).

---

<sup>8</sup> We tested for subsample stability by estimating the model before and after 10.1994. Although there were some signs of lack of stability due to the vast program of price liberalisation in October 1994, Chow's test could not reject the hypothesis that the coefficients of the cointegrating vector were identical in the two samples. The other diagnostic tests do not give us prejudicial results to carrying out the analysis.

<sup>9</sup> Dickey-Fuller test for stationarity does not reject the hypothesis that :  $WR_t = W_t - \text{CPI}_t \sim I(0)$  : DF = - 3.583 (*P*-value 0.0418).

<sup>10</sup>  $\Delta W_{t-2} = 0.070$  (*t*-test 0.665, *P*-value 0.510) and  $\Delta \text{CPI}_{t-1} = 0.032$  (*t*-test 0.200, *P*-value 0.842).

Alternatively, the test of cointegration suggested by P.Boswijk (1991) for the direct estimate of the system of error correction confirms the results of Engle and Granger Test.

$$\Delta \text{CPI} = \Delta W + \Delta W_{t-1} + \Delta W_{t-2} + \Delta \text{CPI}_{t-1} + \Delta \text{CPI}_{t-2} + \text{CPI}_{t-1} + W_{t-1}$$

$$\text{CW (Corrected Wald)} = 6.44 > 4.73$$

( $\xi_t$  statistic for constant = trend = 0 at 20 % and k =1)

Eliminating non significant variables, we obtain<sup>11</sup> :

$\Delta \text{CPI}_t$	coeff.	t-stat.	P-value
$\Delta W_t$	0.577	9.909	0.000
$\Delta W_{t-1}$	0.208	2.981	0.005
$\Delta \text{CPI}_{t-2}$	0.246	3.148	0.003
$\text{CPI}_{t-1}$	- 0.703	- 2.820	0.007
$W_{t-1}$	0.271	2.805	0.008

Following this approach, 1.15 and - 0.385 are respectively the long term coefficient of wages and the adjustment of variables in the short period.

The two preceding methods furnish coherent estimates with the economic interpretation previously given. In any case, in the end to overcome the problem of the superconsistence of the estimator OLS of the cointegrating vector in samples of small dimension [Stock, 1987] alternatively we could utilise as corrective mechanism in the place of residual of the static regression the retard value of real wages (this being a stationary variable). In this case the coefficient in the short period would be 0.242, not very different from - 0.318 or - 0.385 previously estimated.

Surprisingly, from the beginning of the year 1996, the inflationary pressures have grown weaker and the monthly rate of inflation decreased below the level of 10 percent per month.

This reversal of situation apparently reveals that the high inflationary regime as described above was replaced by a non inflationary one.

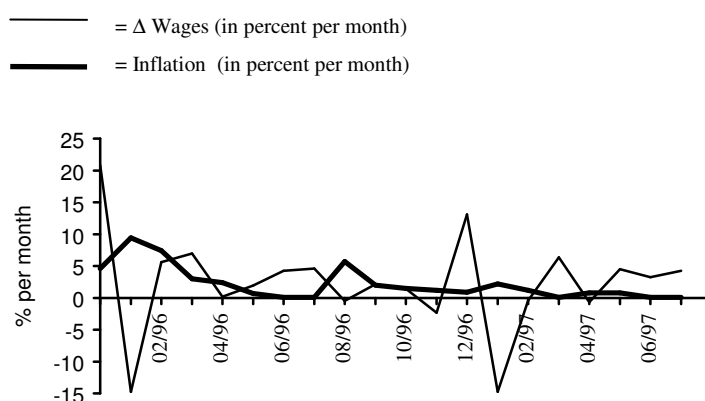
---

<sup>11</sup>  $\Delta W_{t-2} = 0.068$  ( $t$ -test 0.642,  $P$ -value 0.525) and  $\Delta \text{CPI}_{t-1} = 0.030$  ( $t$ -test 0.191,  $P$ -value 0.849).

## 2. On the process of monetary stability (1996-1997)

The beginning of the year 1996 can be conceived as the stopping point of the high inflationary process in the Ukraine. Such an improvement on the monetary field led to the introduction of the Hryvnya as Ukraine's national currency in September 1996. This definite improvement on the field of inflation is too recent to be the subject of a significant statistical test. Nevertheless, through our institutional lecture and it is possible to outline the main features of the new Ukrainian monetary regime. The first feature to mention is that the tenuous relation linking the high inflationary pressures and the financing of wages is untied (see graph 2).

**Graph 2 : Trend of inflation and Wages from 1996**

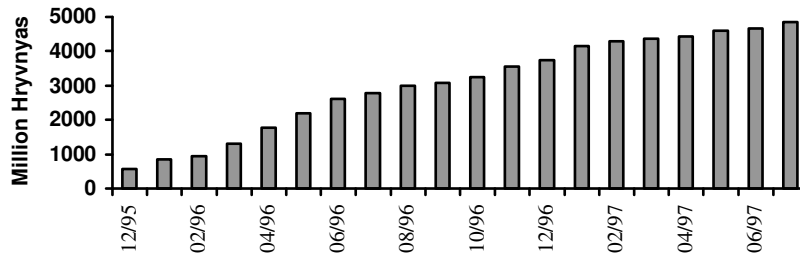


In reality, the new Ukrainian monetary regime is as complex as the former one. Admittedly, it is non-inflationary anymore but, despite appearances, the financing requirements of wages are still at the core of the Ukrainian monetary instability. From the beginning of the year 1996, the government strongly decreased the financing of wages by issuing of fresh money. Such a decision was motivated both by the government agreement signed with the IMF and the wish to attract foreign investors. As a matter of fact, the high inflationary pressures discouraged foreigners to invest in the Ukraine. Nevertheless, neither real nor political factors were clearly indicating that the time of financing the unpaid wages by a seigniorage policy was over.

By the end of 1995, the state sector still represented some 55 percent of fixed commercial assets. Moreover, a set of restrictions and high taxes on private business favoured the state sector and forced much private business activity into the 'Shadow economy'. Land reform was constantly putting back. Ill-defined property rights, complex regulations and a seemingly arbitrary system of taxation hindered economic

reforms. Lastly, the gross domestic product was still downward oriented. Therefore, the Ukrainian authorities were in the beginning of 1996 faced with the same constraints than those existing since the starting of the Ukrainian transition process. Once both the decisions of stopping the seigniorage policy and undertaking a relatively tight monetary policy taken, the government was confronted to a shortage of revenues. Consequently, wage arrears increased every months and are still now increasing (see graph 3).

**Graph 3 : Evolution of wages arrears**



Such an augmentation of wage arrears impoverishes significantly private agents which are obliged to find extra-job to maintain their standard of living. Moreover, the phenomenon of increase of wage arrears reduce tax revenues. But, if the tax system is not enough efficient to finance the budget expenditures then such a situation cannot last long. Unfortunately, from the end of the year 1996, the ability of the tax system to raise revenues and target income generating activities remains under question. Following the example of Russia and Bulgaria, the Ukraine developed large tax arrears (see table 1).

A decrease of tax revenues associated with an augmentation of wage arrears shape a complex monetary regime. Such a new monetary regime prevents people to form reasonable expectations because it is impossible for any rational agent to know how much he will be paid at the end of the month.

**Table 1 :Tax Arrears (in million/Hryvnyas) <sup>12</sup>**

	November 1996	December 1996	January 1997	February 1997
VAT	596,3	535,1	561,2	916,9
Profit taxes	395,8	410,4	314,1	264,5
Land taxes	127,3	167,4	167,6	211,90
Excise	39,8	30,8	34,7	35,1
TOTAL	1349,2	1307,9	1302,9	1718,3

On one side the new monetary regime is non-inflationary but on the other side it is not sustainable if the tax revenues do not rise enough to cover the public expenditures and especially those relative to the payment of public wages. As mentioned previously, the share of the public sector is still very important in the Ukrainian economy. For the moment, the government succeeds in keeping the inflation rates surprisingly low but a renewed galloping inflation is possible. As a matter of fact, there is not any institutional rule preventing the government to have recourse to monetary issue in the aim of financing the unbearable budget deficits. Admittedly, the National Bank of Ukraine and the cabinet of minister work jointly to contain the Hryvnya inside a currency band. The limits fixed are 1.7 - 1.9 Hryvnya/ US Dollars. Such a corridor of stability should be legalised. The private agents know that the budget is chronically unbalanced and fear a new monetization of deficits. Consequently, fixing the exchange rate is a strong message to price setters, allowing private agents to co-ordinate their forecasts on a low inflation path.

Obviously, fixing firmly the inflation low by managing a corridor of stability for the Hryvnya is not the only policy to implement. Fiscal reforms concerning both nationals privates agents and foreign investors should support the anchoring of the Ukrainian exchange rate.

## **Conclusion**

Empirical evidence shows that the payments of wages by issue of fresh money were at the core of the high inflationary period experienced by the Ukraine between 1992 and 1996. Such a relation Prices - Wages shaped a complex monetary regime and maintained upwards inflationary pressures. In 1996, the Ukrainian government succeeded in keeping the inflation low but the cure used for the disease inflation provoked an important accumulation of wage arrears.

---

<sup>12</sup> Source: Ukrainian Economic Trends, Monthly update, March 1997, p. 4.

A new monetary regime as complex as the former ones appeared. In order to anchor downwards the inflation, both a fixation of the exchange rate of the Ukrainian currency and a fiscal reform could allow to the government to solve its problem of credibility.

## References

- Bofinger P., Flassebeck H., Hoffmann L. (1995), 'The Economics of Orthodox Money-based Stabilizations: the Examples of Russia, the Ukraine and Kazakhstan', *Working Paper*, DIW Berlin and University of Würzburg, August.
- Boswijk P., (1991), 'Testing for Cointegration in Structural Models', Department of Actuarial Science and Econometrics, University of Amsterdam, May.
- Cagan P. (1956), 'The Monetary Dynamics of Hyperinflation', in M. Friedman, ed., *Studies in the Quantity of Money*, Chicago: University of Chicago Press.
- Cukierman A. (1992), *Central Bank Strategy, Credibility and Independence: Theory and Evidence*, The MIT Press, Cambridge, Massachusetts.
- Cukierman A., Edwards S., Tabellini G. (1992), 'Seigniorage and Political Instability', *American Economic Review*, 82, pp.537-55.
- Dickey D.A., Fuller W.A. (1979), 'Distibution of the Estimators for Autoregressive Time Series with a Unit Root', *Econometrica*, 49, pp.1057-1072.
- Engle R.F., Granger W.J. (1987), 'Co-integration and Error Correction: Representation, Estimation and Testing', *Econometrica*, 55, pp.251-276.
- Halushka A., Savluk S., Wörgötter A. (1994), 'Ukrainian Hyperinflation: History, Analysis, Recommendations', *Höhere Studien*, 10, September, Vienna.
- Havrylyshyn O., Miller M., Perraudin W. (1994), 'Deficits, Inflation and the Political Economy of Ukraine', *Economic Policy*, October, 19, University Press, Cambridge.
- Heiner, R.A. (1983), 'The Origin of Predictable Behavior', *American Economic Review*, 83, September pp.560-595.
- Heymann D., Leijonhufvud A. (1995), *High Inflation*, Clarendon Press, Oxford.
- Hueber O. (1996), 'The Abnormally Persistent and High Inflation in Ukraine', in *Modelling and Analysing Economies in Transition*, Jan W. Owsinski and Zbigniew Nahorski Editors, Warsaw 1996 , pp.203-217.
- Hume D. (1875), *Essays, Moral, Political and Literary of Money*, Green T.H. and Grose Th. Ed., London. First ed. 1750.
- Leijonhufvud A. (1986), 'Rules with some Discretion" in Campbell and Dougan, eds., *Alternative Monetary Regimes*.
- Leijonhufvud A. (1995), 'Macroeconomics and Complexity: Inflation Theory', Communication to the conference 'The Economy as an Evolutionary Complex System II', Santa Fe, 1995, August 27th - September 1st.
- Leijonhufvud A. (1995), 'Adaptative Behavior, Market process and Computable Approach', *Working Paper*. Centre for Computable Economics. University of California, Los Angeles.
- MacKinnon J.G. (1990), 'Critical Values for Cointegrating Tests', *University of California at San Diego Discussion Paper*, 90-4, January.
- Ricardo D., *Works*, P. Sraffa ed., Cambridge, 1951, vol. III.

Stock J.H. (1987), 'Asymptotic Properties of Least Squares Estimators of Cointegrating Vectors', *Econometrica*, 55.

Winiecki J. (1993), 'Knowledge of Soviet-type Economy and "Heterodox" Stabilization-Based Outcomes in Eastern Europe', *Weltwirtschaftliches Archiv*, Heft 2.

Filename: FAZIO97.doc  
Directory: D:\Olivier H\ARTICLES  
Template: D:\Documents and Settings\Olivier\Application  
Data\Microsoft\Templates\Normal.dot  
Title: On the role of wages in the process of monetary transition in the Ukraine:  
Subject: Version pour publication  
Author: Olivier Hueber  
Keywords:  
Comments:  
Creation Date: 08/01/1998 10:53  
Change Number: 2  
Last Saved On: 08/01/1998 10:53  
Last Saved By: IDEFI  
Total Editing Time: 6 Minutes  
Last Printed On: 31/03/2004 6:31  
As of Last Complete Printing  
Number of Pages: 14  
Number of Words: 4 267 (approx.)  
Number of Characters: 22 446 (approx.)