BULGARIAN NATIONAL BANK

Real Wage Rigidity and the Monetary Regime Choice

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Contents

SUMMARY. THIS PAPER PRESENTS THEORETICAL AND EMPIRICAL ANALYSES OF THE LABOR MARKET IN THE FRAMEWORK OF BULGARIA'S MONETARY REGIME. THE THEORETICAL SECTION EXAMINES THE RELATIONSHIP BETWEEN LABOR MARKET AND MONETARY REGIME, ANALYZES WAGE INTEGRATION WITH EXCHANGE RATE DYNAMICS AND SELECTED MAJOR ECONOMIC IDENTITIES. SOURCES OF LABOR MARKET RIGIDITY IN A TRANSITION ECONOMY ARE REVIEWED. THE EMPIRICAL SECTION INCLUDES, INTER ALIA, CONSTRUCTION OF REAL WAGE RIGIDITY INDEX (STUDY OF ITS DYNAMICS AND COMPARISON WITH EU COUNTRIES), ECONOMETRIC SIMULATION OF REAL WAGE FLEXIBILITY THROUGH VAR MODELS, IDENTIFICATION OF SECTORS WITH RIGID AND FLEXIBLE WAGES THROUGH A PANEL MODEL. THE THEORY OF OPTIMUM CURRENCY AREAS IS BRIEFLY REVIEWED FROM A LABOR MARKET PERSPECTIVE AND ANALYSIS OF THE RELATION BETWEEN BULGARIA'S FUTURE INTEGRATION INTO THE EUROPEAN UNION AND THE STATE OF THE LABOR MARKET IS MADE.

JEL classification: E4, J3, P3.

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Importance and Structure of the Study

In mid-1997 the monetary regime in Bulgaria was radically changed from discretionary central bank and floating exchange rate to currency board arrangement and fixed exchange rate. Discussion on Bulgaria's accession strategy to the European Monetary Union and prospective introduction of the euro[1] logically raises the issue of the necessary preconditions to facilitate integration processes. It is important to consider institutional changes in the Bulgarian monetary regime in the context of labor market and its dynamics, which has been given little attention so far. At the same time, the EU and the other candidate countries have been actively discussing labor market reforms and liberalization in the context of central bank, monetary policy, exchange rate regime and the introduction of the single European currency (see e.g. *Calmfors, L.* (1998, 1998a); *Viñals, J., J. Jimeno* (1998); *Berthold, N., R. Fehn, W. Thode* (1999); *Soltwedel, R., D. Dohse, C. Krieger-Boden* (1999); *Ferenczi, B.* (1999); *Cukierman, A., F. Lippi* (1999, 1999a); ECB (2000); BIS (2000)). Recently it has been argued that rigid labor market is critical to both EU member countries and candidate countries. Furthermore, the ECOFIN report of 7 November 2000 on the compatibility of exchange rate regimes of EMU candidates states: "Fixed exchange rate regimes, including Currency Board arrangements, can be sustainable in small and open economies with sufficient wage and price flexibility, strict fiscal discipline and sound financial system."[2]

The main task of the study is to analyze the relation between the monetary regime and the state of the labor market in Bulgaria. Although labor market rigidity is not completely reduced to real wage rigidity, the latter is a major issue in the theoretical and practical debate. Therefore, we focus on real wage behavior.

The paper is structured as follows: section two provides a brief analytical interpretation of the relation between labor market flexibility (especially real wage flexibility) and monetary regime rigidity. It focuses on the role of labor market flexibility for smooth currency board operation and credibility. Section three reviews the sources of labor market rigidity, especially real wage rigidity in a transition economy. Empirical study of labor market rigidity is presented in section four. A real wage rigidity index is constructed applying the methodology of

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[1] In actual fact, sooner or later, Bulgaria will introduce the euro (we are concerned here only with the time dimension).
[2] *ECOFIN* (7.XI.2000).

Layard, R., S. Nickell, R. Jackman (1991), updated by *Viñals, J., J. Jimeno* (1996, 1998) and its application to developed countries. The relation between unemployment and real wages and their impact on fiscal reserves, reserve money and interest rates are examined. A hypothesis of the relation between state sector and private sector wages is stated. Section five deals with the relation between euro adoption and labor market. The final section concludes and makes some practical recommendations for labor market liberalization as a precondition for Bulgaria's integration into EMU and its transition to the single European currency.

The Labor Market and the Monetary Regime Choice

The relation between labor market and exchange rate regime[3] is two-way.[4] On the one hand, the state of the labor market (i.e. degree of flexibility) is a major precondition for monetary regime choice and a factor in the institutional change of money. On the other hand, imposition of a monetary regime (softer or harder) has a reverse effect on the degree of labor market flexibility. Given this effect, the choice of a monetary regime can be seen as instrumental in enhancing real economy flexibility. Traditionally, it is argued that a more flexible labor market allows for the choice of a firmer monetary regime (optimum currency area theory). A most recent hypothesis argues that the more rigid the monetary regime is, the stronger is the flexibility of the labor market (*Borjas, G.,* 2000).[5]

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[3] We examine the currency board as a formal part of the institutional system of money. Following the standard definition of institutional system (*North, D.*, 1990), we assume that the institutional system of money (i.e. money supply and demand) can be reduced to three components: monetary regime (combination of formal rules), informal rules and a mechanism for enforcement of formal and informal rules. Informal institutions play key role in the overall structure of the institutional system. In this paper, we will consider only formal rules (the currency board).

[4] See the schematic presentation of the relation between monetary policy (discretionary bank) and trade union claims in *Nenovsky, N.* (1991), and the empirical testing of the relation between unemployment and inflation in European countries in *Nenovsky, N., K. Schram, M. Ziad* (1993/1994).

[5] *Borjas, G.* (2000) proves empirically the relation by examining the relation between labor market and monetary regime (reduced to floating, fixed exchange rate or dollarization), using Mexico as an example.

Figure 1

LABOR MARKET AND MONETARY REGIME
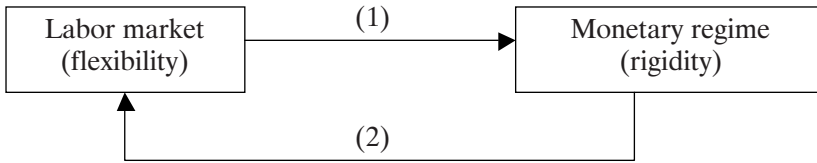
The major problem in the relation between labor market (LM) and monetary regime stems from the existing lag between (1) and (2), where a rise in unemployment may tempt into higher inflation and devaluation, leading eventually to a collapse of the rigid monetary regime (i.e. transition to a flexible one), unless structural measures for enhancing LM flexibility are taken. Hence the need for parallel LM liberalization at hard monetary regime introduction, which, in turn, would lead to an even harder monetary regime. In this line of reasoning the hypothesis of the two spiral-like multi-equilibrium dynamics of the monetary regime – LM relation in both directions (hard peg ⟶ flexible LM and soft peg ⟶ rigid LM) can be derived.

In mainstream macroeconomics, the impact of LM on the monetary regime can also be derived from the *monetary regime credibility problem*. The more rigid the LM, the higher the equilibrium level of unemployment and the graver the problem with monetary authorities' credibility. In this situation, inflation also increases due to monetary authorities' strongly pronounced time inconsistency – they would benefit to a greater extent from devaluation and monetary expansion.[6] The credibility issue is even more critical under a fixed exchange rate regime, especially currency board arrangement, which imposes tight constrains on devaluation. Therefore, LM becomes crucial to currency board stability.

Why is this so? For simplicity, we reduce *the channels through which the economy adjusts to four*: exchange rate, labor market, fiscal policy, and monetary policy. The currency board regime leaves only fiscal policy and LM flexibility. According to the empirical research in *Berthold, N., R. Fehn, E. Thode* (1999) for EU countries, the more rigid

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[6] According to some new studies, real wage flexibility, unemployment, the degree of syndication, and the manner of wage setting should be taken into consideration in conducting monetary policy and in establishing the optimum contract of the central bank (*Cukierman, A., F. Lippi, 1999, 1999a, Lawler, P.,* 2000).

the real wages are, the higher are the budget deficit and domestic debt. Since fiscal policy under a currency board is constrained by the requirement to maintain fiscal equilibrium so as not to threaten the fixed exchange rate (through depletion of forex reserves), LM flexibility becomes the major substitute of exchange rate movements. It can be reduced to flexibility of volumes – labor force dynamics (N), and price flexibility – real wage dynamics. If real wages (*W/P*) are flexible, unemployment is absorbed and does not threaten the fixed exchange rate. Otherwise (as is in most cases), unemployment becomes a major threat to currency board stability. Chart 1 illustrates an upward trend in unemployment rate after currency board introduction in mid-1997.

Chart 1

UNEMPLOYMENT DYNAMICS
(JANUARY 1997 – JUNE 2000)
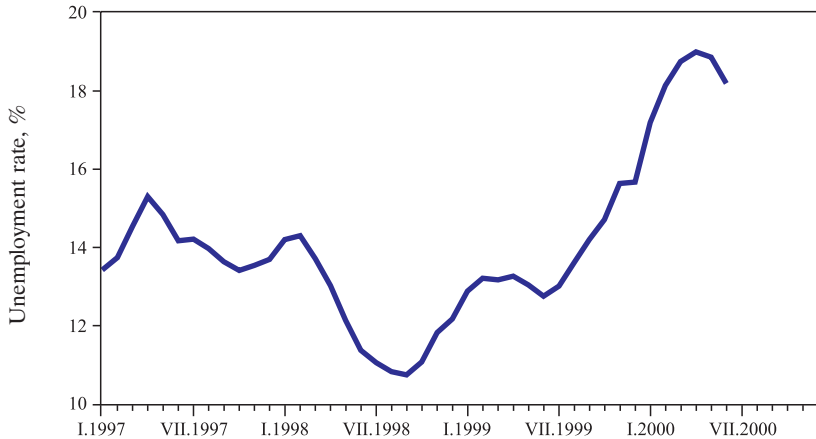
In their game model of currency board credibility,[7] *Rivera-Batiz, L., A. Sy* (2000) assume that monetary authorities face the trade-off between *devaluation and unemployment* and a deviation from the natural rate of unemployment is seen as an argument in the government loss function.

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[7]Publications attempting to model the currency board through the theory of games as a kind of continuation of game models for analyses of fixed exchange rates (*Obstfeld, M.*, 1996) are few. Apart from the cited model of *Rivera-Batiz, L., A. Sy* (2000), *Ho, C.* (1999) also attempts a game model of an attack against CB, using the bank panic model in the tradition of *Diamon – Dybvig*. The idea of modeling an attack against CB was presented in *Nenovsky, N., K. Hristov, B. Petrov* (1999) but was not formalized.

Unemployment hysteresis is seen as one of the major parameters determining the result of the game between government (monetary authority) and economic agents, and the decision on exiting the level of the fixed exchange rate (and the CB system). The shock simulated in this model arises from LM. Although the 'devaluation or unemployment' dilemma chosen by the authors may be subject to theoretical critique, experience with existing CBs shows that unemployment does threaten the stability of a CB or fixed exchange rate regimes.

Let us consider this from the perspective of CB adjustment mechanism. It is generally assumed that movement in economic agents' real income as a component of aggregate demand is an important element of the *CB automatic adjustment mechanism*. For example, if money supply contracts (caused by a deficit in the balance of payments), public income needs to be reduced in order to lower money demand and hence reduce the price level and improve competitiveness of the economy under a fixed exchange rate regime. Low inflation and price volatility under CB allow for the better reading of signals arising from changes in nominal wages and for the better matching of labor demand and supply.

The relation between *wages and productivity* gains particular importance under a fixed exchange rate regime, for one of the most frequently criticized issues is exchange rate overvaluation and current account worsening. We denote the real exchange rate as e_r, e is the nominal exchange rate in direct quotation,[8] p is the price level, q is productivity, and w are nominal wages (where * means the level of the respective variable abroad), all variables taken in logarithm, we derive the following equations:

$$e_r = e + p^* - p \qquad (1)$$

$$p = w - q \qquad (2)$$

$$p^* = w^* - q^* \qquad (3)$$

Overall, the real exchange rate can be expressed as:

$$e_r = e + (w^* - q^*) - (w - q) = e + w^* + q - w - q^* \qquad (4)$$

Equation (4) shows that the real exchange rate depreciates, i. e. $e_r\uparrow$ increases with increases in the nominal exchange rate, wages abroad and domestic productivity, and vice versa: it appreciates as domestic nominal wages and productivity abroad increase. The productivity/wages ratio should also be differentiated for the tradable and

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[8] Local currency units per 1 foreign currency unit.

nontradable sector (to take into account the *Balassa–Samuelson* effect). As we know, wages in the nontradable sector tend to equal those in the tradable sector, though their productivity is comparatively lower. When wages are inflexible, the *Balassa–Samuelson* effect enhances. Thus part of wage growth is not motivated by higher productivity which leads to faster overvaluation of the exchange rate (*Nenovsky, N., V. Yotzov, K. Hristov*, 2000).[9]

It is possible to link the *quantitative theory of money* (where real income is presented as the sum total of consumption, investment, public spending and net exports) and equation (2), which explains prices through wage and productivity dynamics. After elimination of prices, we drive the following complex relationship to determine wages:

$$m + v = y + p \tag{5}$$

$$y = c + i + g - t + x - imp \tag{6}$$

$$w = m + v + t + imp + q - c - i - g - x, \tag{7}$$

where
  m is money stock,
  v is money velocity,
  y is real income,
  t is taxes in real terms,
  imp is imports in real terms,
  i is private investment in real terms,
  g is public spending in real terms,
  x are exports in real terms (variables are taken in logarithm).

Clearly, nominal wages increase as money stock, money velocity, imports, taxes and productivity increase, and decreases as consump-

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[9] The analysis of exchange rate overvaluation is complicated by a common relation used in the labor market theory, *the efficiency wage theory*. It is based on the theoretical hypothesis of the existing positive relation between wages and productivity. According to a number of empirical analyses, wages maximizing labor productivity and minimizing opportunistic behavior are above equilibrium in the neo-classical model. There exists a function of labor efforts where higher wages stimulate employees, tie them to companies and discourage them from participation in trade unions. This is one explanation of the issue why adjustments arising from changes in labor demand are effected through the number of employees not through wages. If we reason in the context of the Bulgarian monetary system, it may turn out that wages below the natural level constrain productivity thus causing a faster overvaluation of the fixed exchange rate. Of course, this is a theoretical hypothesis and empirical analyses are needed to determine the level of wages at which the function of labor efforts will reach its maximum. The above relations lead to a change in equation (4) which assumes the form:

$$e_r = e + w^* + q(w) - w - q^*(w^*). \tag{4'}$$

tion, investment, government spending and exports decrease.

Let us consider the sources of CB rigidity in transition economies and in the specific case of Bulgaria.

## Theoretical Aspects of Labor Market Rigidity Sources in a Transition Economy

From the outset of reforms in the former centrally-planned economies, the *determining role of the LM* both for financial stabilization (wage growth should not be higher or lower than productivity growth) and real economy restructuring (workers should move to those productions where productivity allows growth in wages) was recognized in most theoretical models. Clearly, the LM had to absorb most of the changes, particularly changes in ownership and closure of loss-making businesses and in productivity as well as determine growth prospects. For this reason, a great number of theoretical and empirical models of transition were reduced more or less to modeling the dynamics of different LM flows, adding to this mainframe different components of monetary variables, exchange rates, the balance of payments, etc. (from the many publications see those of *Layard, R.,* (1991, 1994); *Coricelli, F., G. Milesi-Ferretti* (1993); *Aghion, P.* (1993); *Wyplosz, C. (1993); Chadha, B., F. Corricelli, K. Krajnyák (1993); Garibaldi, P., Z. Brixiova* (1997)). Particularly interesting are the analyses made by Olivier Blanchard (*Blanchard, O.,* 1997) who synthesizes in his book the LM dynamics and the overall transformation process in Central and Eastern Europe (CEE).

Let us imagine the economic system as a *pyramid*: the corporate system at the base, the fiscal and monetary regime at the top, and LM in the middle of the pyramid. In the absence of political and economic will to restructure corporate organization, the hard monetary regime will run counter to macroeconomic fundamentals if the labor market is not liberalized. If rigidities in corporate organization are accompanied by rigidities in the LM, soft and discretionary monetary regime and a central bank should offset this. The introduction from *top downward* of tighter forms of monetary regimes (as the CB in Bulgaria) is a kind of institutional response, aimed to spread monetary constraints across the entire chain downward, and a form of pressure on the LM to liberalize. A rapid rise in unemployment after the introduction of hard monetary regimes is an indirect proof of hidden wage rigidity at the time of soft monetary constraints.

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Mainstream macroeconomics postulates that LM is one of the major sources of rigidity in the economic system.[10] Broadly speaking, *LM flexibility* is seen as a possibility to permanently adjust wages and employment in accordance with labor supply and demand by economic sector and by labor category. At a more specific level of analysis, LM flexibility has different dimensions: flexibility of the general level of real wages, of relative real wages, of work hours, of labor contracts and labor legislation in general, of geographic mobility of workers, etc. (see *Soltwedel, R., D. Dohse, C. Krieger-Boden*, 1999, and Figure 2). According to some economists, real wages are flexible when unemployment exerts strong pressure on equilibrium wages (*Berthold, N., R. Fehn, E. Thode*, 1999).

Figure 2

DETERMINATION OF LABOR MARKET FLEXIBILITY
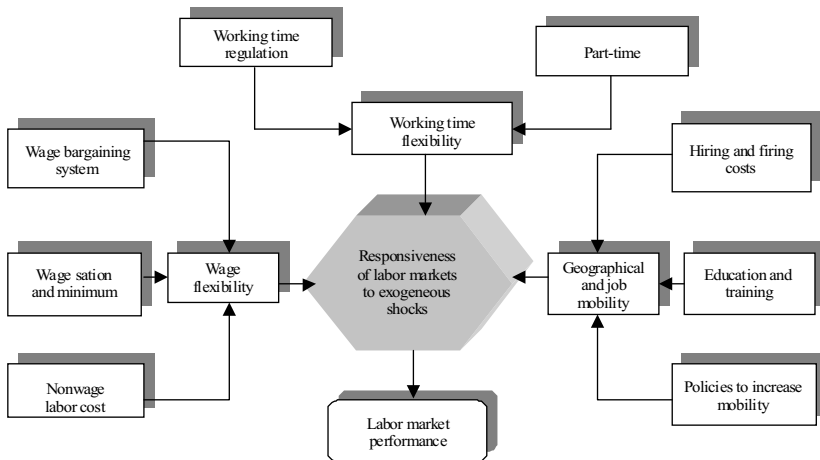
Source: Dohse, D., C. Krieger-Boden, 1998, p. 49.

The mechanisms of flexibility have deep microeconomic roots reflected in the opportunity for an employer and a worker to sign a labor contract in accordance with their preferences and expectations. In this sense, the freedom of contracting and the equal footing of the two parties (viewed as voluntary act) underlie LM flexibility. Only in these conditions can the business find that level of labor demand that best

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[10] See, for example, the popular interpretation in light of disequilibrium theory of the early 1980s in *Malinvaud, E.* (1980, 1983, 1991).

matches demand for its output and workers will offer that quantity of labor that matches their spending. In the ideal condition of equilibrium, real wage dynamics will be closely tied to that of labor productivity. The stable structure of *relative wages* also matters. Any imbalance through social security benefits, unemployment benefits and employment policies lead to disequilibria, inefficiency and redistribution of incomes and resources. Income, specifically wages, may be viewed as a kind of prices, information signals for rechanneling resources in the economy.

The major *reasons for LM rigidity* are well studied (see the overview in *Romer, D.* (1997) and *Perrot, A.* (1998)), reflecting deviations from basic Walras equilibria postulates – information asymmetry[11] and strategic behavior of firms and workers.[12] Thus, to one extent or another, explanations of the deviations from the natural rate of unemployment are found. The latter, however, is a function primarily of the LM institutional structure which includes the degree of syndicateness, the structural level of bargaining between employees and employers (firm, industry, national level),[13] the social security system (minimum wage, social security, unemployment benefits, pension insurance, health in-

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[11] Information asymmetry in post-communist countries is even more strongly pronounced, given the legacy of the system of labor resources and wages planning, completely dividing the labor market from its optimum state. The present LM state provides evidence on the conflict between formal institutions (labor legislation, etc.) and informal institutions of labor relations inherited from communism.

[12] At a specific level, the immediate reasons are the opportunistic behavior of workers (see for example the classical paper by *Shapiro, C., J. E. Stiglitz* (1984)), the behavior of efficiency wage, presence of implicit contracts (e. g. long-term relationship between enterprises and employees), a complex relationship between LM incoming and outgoing workers, the presence of hysteresis in unemployment behavior, as well as difficulties in accommodating vacancies with those searching jobs (expressed by the Beveridge curve or the so-called search model).

[13] The issue of the *optimum structural level of wage setting* (*wage bargaining*) is not yet resolved theoretically, although there is empirically confirmed relationships. Wage setting at an interim level – sector – is considered as most inefficient (such is the practice in France, Germany, Italy, Spain and the Netherlands). The classical study of *Calmfors, L., J. Drifill* (1988) is focused on the inefficiency of interim wage setting. According to the authors, in this case wages drift most significantly from labor productivity and macroeconomic fundamentals. At sector level, competition is lowest and the possibility for macroeconomic effects to be included in labor contracts is the smallest. Sharing their view, we argue that decentralized wage setting is most appropriate (at firm level) as it takes into account the specifics of each work place. Such is the practice in the USA and Canada (*Blanchard, O.*, *L. Katz*, 1999). A similar proposition for decentralized wage setting in the EU is made in the OECD report (1998). There is another group of economists, however, who consider that the decentralized level leads to greater rigidity as macroeconomic fundamentals are not taken into account. This is not the case where wages are set at national level (*Layard, R.*, 1991). In our opinion, wage setting at national level (as is the practice

surance), the tax system, the size of the hidden economy, etc. (see *Layard, R.* (1991); *De La Rica, S., T. Lemieux* (1993), *Garibaldi, P., Z. Brixiova* (1997); *Blanchard, O., L. Katz* (1999)).[14]

Another theoretical approach to explaining the issues of LM in CEE, in Bulgaria particularly, is *the approach of dual and segmented LM*.[15]

Models for the developing countries assume migration from the primary (so-called urban) to the secondary sector (rural) and respective adjustment. In contrast, models for CEE countries are totally different. Migration from the primary to the secondary sector and vice versa is very weak and this is one of the reasons for the significant official unemployment. The majority of the population, having inherited certain customs and norms of socialist behavior, prefer not to work rather than participate in the LM of the less paid and highly competitive secondary sector. The great number of higher education graduates that cannot be absorbed by the primary sector and unwilling to work in the secondary sector complicates this. It could be assumed that with a possible liberalization of labor force mobility within the EU a great number of un-

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in Austria, Belgium, Portugal, the Scandinavian countries) has destructive consequences on the adjustment process in the real wages network and entails greater structural unemployment. This is so because relative wages play a role similar to that of relative prices and serve as major information signals for firms and employees (an old idea of Ludwig Mises). According to a number of BIS analyses, it is possible that EMU and the introduction of the euro will force bargaining between employers and employees to move toward centralization at EU level or to increase wage setting at firm level (BIS, 2000). *Soltwedel, R., d. Dohse, C. Krieger-Boden* (1999) argue that this trend has already begun.

[14] An interesting field of analysis would be the analysis of the LM as a form of conflict between the formal, official institutional structure of this market and the informal institutional structure (traditions, customs, etc.).

[15] The main idea is that there is no uniform LM but a variety of markets; the connection between them is often broken and there are no adjustment mechanisms. The theory of dual markets, a kind of continuation of the analyses of LM in the developing countries in the 1970s (*Harris, J., M. Todaro*, 1970; *Calvo, G.*, 1978), distinguishes two sectors: *primary* with high wages (above equilibrium), steady employment and career prospects, and *secondary* with low wages, high mobility of labor force and no career prospects. The first sector includes big public and private corporations and budget organizations (highly qualified labor force required) while the second one is typical of small and medium businesses (less qualified labor force required). The second sector is competitive and has low unemployment level, while the first one is rigid and full of asymmetric information. A third segment is the unemployed coming mainly from the primary sector. The connection between the sectors is broken because there are a number of individuals who prefer to be unemployed and wait to be employed in the primary sector rather than the secondary sector. The primary sector is characterized by the presence of internal markets expressed in implicit contracts between employers and employees (e. g. a contract for laying off workers in adverse conditions and reverse employment in favorable conditions, as is the practice in the USA).

employed in Bulgaria (even those who do not want to work in the Bulgarian secondary sector) will be willing to work in the EU secondary sector because of higher wages. Increased labor supply in the EU competitive market will lead to lower wages, providing benefits to businesses in the eurozone. It is very unlikely for primary sector employees in CEE to move to EU primary sector. Thus, it may be assumed that after EU expansion three sectors would be formed: primary, a privileged place for EU employees, secondary, in which the majority of the CEE primary sector would go, and tertiary which would be typical of CEE employees.

Dynamic interaction between the two major sectors – the restructuring (and privatizing) state sector and the private sector – is particularly important for the analysis of LM rigidity and imbalances in CEE. *Blanchard, O.* (1997) constructs a general equilibrium model where the state of LM in CEE (unemployment and wages) reflects the different pace of development of state and private sectors.[16] According to him, unemployment (and the dramatic decline in GDP) can be explained by the fact that at the initial stage of reform the private sector is relatively small and incapable of absorbing the dissolution of the state sector, which may be possible at a later stage. This is the effect of changes in private sector size. The second explanation of unemployment is that real wages in the state sector are sticky and with abolishing subsidies lower labor demand from state companies leads to layoffs and unchanged wages. Demand for labor from the private sector does not change (according to Blanchard it may contract under certain conditions). If wages in the state sector were not sticky, unemployment would be overcome. Graphically, Blanchard illustrates this as shown below:

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[16] In his models *Blanchard* studies the effects of unemployment benefits, type of privatization, etc. on the LM and the overall process of restructuring. According to him, the relationship is not clearly pronounced. Following the proposition that unemployment benefits increase unemployment, the author examines a situation when higher unemployment benefits would stimulate state sector employees to take the risk of restructuring enterprises, knowing that if they are unemployed they would receive higher compensations. However this process has negative effects on the private sector as the possibility of finding a job is reduced. Generally, the overall effect is not clear. The author reviews another interesting relationship. Wages in the private sector depend on the profit of the company, which in turn depends on wages to a great extent. Given the fact that wages decrease as unemployment increases it may be assumed that high unemployment stimulates job creation in the private sector. The third relationship is that the higher the unemployment, the harder the decision-making on state sector restructuring.

Chart 2

BLANCHARD LABOR MARKET IN A TRANSITION ECONOMY
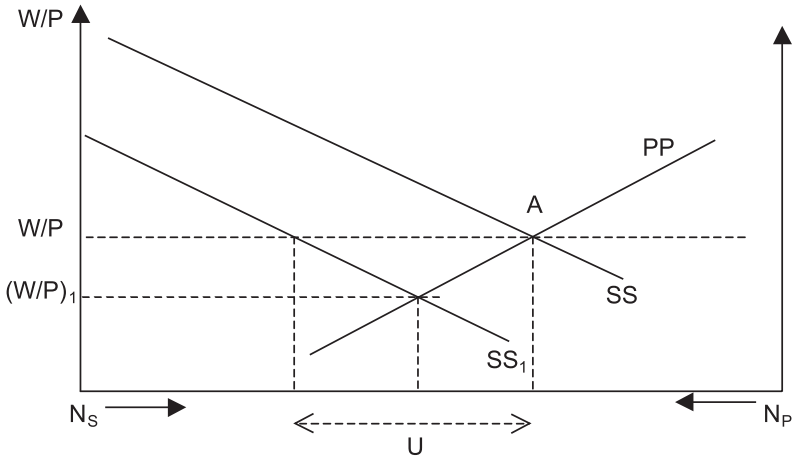
Employment N is shown on the horizontal axis. Employment in the state sector N_S increases from left to right and that in the private sector N_P, from right to left. Real wage (W/P) is designated on the vertical axis. Labor demand in the state sector is described by SS, and by PP in the private sector. Before the start of transition there was no official unemployment and equilibrium is reached in point A. After the initial abolishment of subsidies to the state sector labor demand SS contracts, reaching SS_1. As wages remain unchanged (W/P) and do not fall to $(W/P)_1$, unemployment U emerges.

To report the well-known inconsistency between declared and actual wages in the private sector, typical of Bulgaria, we modify Chart 2. Declared wages in the private sector are much lower than those in the state sector, while actual wages are much higher. This is a *de facto* concealing of incomes and gives a distorted picture of the unemployment level in the country. There is a mechanism of shifting employment from the official to the unofficial sector. It may be assumed that there is a large share of 'illusory', quasi-unemployment reflecting declared low wages in the private sector. Changes are reflected in Chart 3. PP_F is actual demand for labor in the private sector and PP_D is the officially declared one. The pay level in the state sector is between the actual and the declared pay in the private sector.

Chart 3

DISCUSSION PAPERS

**LABOR MARKET EQUILIBRIUM AT PRIVATE SECTOR
DECLARED AND ACTUAL LABOR DEMAND
(OUR MODIFICATION OF THE BLANCHARD MODEL)**
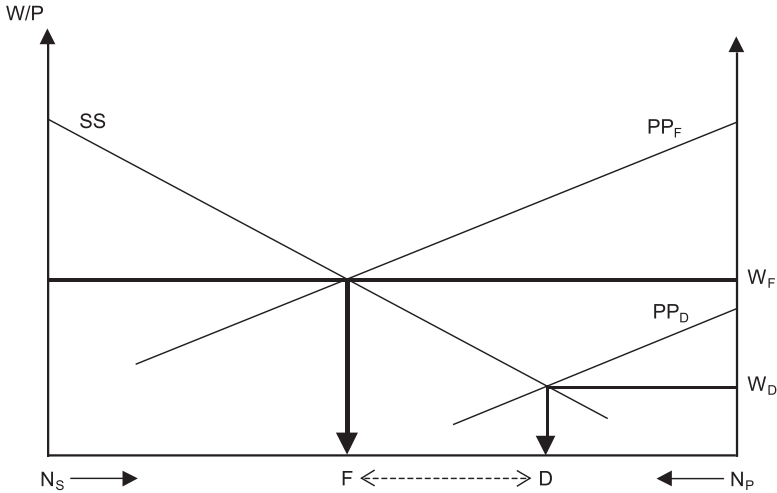
The section N_SF is official employment in the state sector and N_PD is officially declared employment in the private sector. *FD* is hidden employment in the private sector. There are no restrictions for employees in the *FD* sector to register as unemployed. Therefore, given lower declared wages in the private sector, there is illusory or quasi-unemployment. The faster the two values (declared and actual) come closer, the faster will disappear the illusory unemployment and the hidden adjustment mechanism will become visible.

A focal point in the Bulgarian LM analysis is reporting the dynamics and mechanisms of the *shadow economy* (where labor relations are not formally institutionalized), which ranges from 30% to 70% of GDP according to various estimates (for instance, see *Nenovsky, N., K. Hristov*, 2000). The unofficial economy absorbs the bulk of active labor force and is a kind of LM adjustment mechanism, a buffer in the presence of rigid wages in the official sector. For instance, the shadow economy definitely impacts the increase in the so-called reservation wage, i.e. the wage that makes an individual indifferent to unemployment. This way simultaneous maintenance of illusory unemployment and employment in the shadow economy reflects on reducing the im-

pact of the weight of unemployment and LM rigidity on CB stability and the fixed exchange rate.

In the next section, we present several possibilities for empirical research and measurement of the state of the LM in Bulgaria.

Empirical Studies of Labor Market Rigidity

Vassil Tzanov's Studies

Empirical measurements of LM in Bulgaria are few. This gap is filled partly by a series of studies by Vassil Tzanov. *Tzanov, V.* (1999), does a complex modeling of the LM basic relations and constructs a general model. The analysis covers the period January 1991 – November 1997, *de facto* the beginning of the currency board operation. Based on the analysis V. Tzanov draws the following conclusions in the context of LM rigidity:

1) the Bulgarian CB is characterized by presence of imperfect competition, inherited from socialism;
2) there exists a hysteresis effect (mainly in state enterprises) and inertia in employment;
3) there are difficulties in the process of matching labor demand and supply (as derived from the Beverage curve). This is due to weak LM institutional development, which worsens the possibilities for qualitative and quantitative matching;
4) labor supply plays an insignificant role in the process of matching;
5) wage setting is based on anticipated inflation;
6) labor productivity has little weight in explaining wage setting;
7) there is no smooth relation between output movement and employment. For instance, in 1994 – 1995 wages declined and output grew, which, according to the author, indicates over-employment (adjusted later);
8) "obviously the downward pressure the rate of unemployment would exert on wages is insignificant. Therefore, it may be concluded that the labor market does not influence wage setting. The latter reflects external factors like trade unions, administrative measures, etc. rather than market forces." (*Tzanov, V.,* 1999. p. 138).

Overall, V. Tzanov's study confirms the hypothesis of LM rigidity in Bulgaria before currency board introduction.

Construction of Real Wage Rigidity Index and Its Application before and after Currency Board Introduction

To get an idea of LM rigidity in Bulgaria we construct a real wage rigidity index for the **state sector**, assuming that unemployment is attributable to output contraction in the public sector, given the specific features of transition. Also, this is associated with our observations that LM in the private sector is much more flexible than in the public sector.

We use the methodology of studying real wage rigidity proposed by *Layard, R., S. Nickell, R. Jackman* (1991) and the rigidity index constructed by *Viñals, J., J. Jimeno* (1996, 1998). As is well-known, the real wages – unemployment relation is considered more appropriate than the nominal wages – unemployment relation as it overcomes the restrictions in the original Phillips curve model.[17] The reduced form of the equation of wages is:

$$w - p = - c\,(u - hu_{-1}) + z^w \tag{8}$$

$$z^w = e^s + e^w, \tag{9}$$

where w, p, and *u* are logarithms of nominal wages, price indices and unemployment respectively, u_{-1} is logarithm of unemployment with one lag, *c* and *h* are parameters for evaluation, and z^w reflects shocks on nominal wages (where e^s is the technological shock and e^w is the labor supply-side shock), *h* indicates inertia in unemployment, its hysteresis effect,[18] and *c* shows elasticity of real wages to changes in unemployment.

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[17] On the Phillips curve's history see the review in *Humphrey, T.* (1986a). In modern literature generally exist two versions of the Phillips curve: the relation [wages (inflation) – unemployment] and the relation [inflation (wages) – income produced]. The two types of relations are modified to accommodate the NAIRU gap and the output gap. The first version of the Phillips relation can be called unemployment-based approach and the second one, economic acivity-based approach. Each of these has its strengths and weaknesses. Given the objectives of our study (analysis of the labor market, not inflation), we have chosen the more traditional form of the Phillips curve (the unemployment-based one). We should note that the Phillips curve is used as a tool in forecasting inflation (see the review in *Stock, J., M. Watson*, 1999). In this article, the Phillips curve is generally defined as "the relation between current economic activity and future inflation."

[18] The model of unemployment hysteresis and persistence is conventional (*Blanchard, O., L. Summers*, 1987). This method is linear. According to some authors, linearity cannot capture structural changes in unemployment dynamics. That is why more complex forms of hysteresis modeling are proposed (see *Bianchi, M., G. Zoega*, 1996).

Thus the real wage rigidity index (RWR) is:

$$RWR = (c\,(1-h))^{-1} = \frac{1}{c(1-h)} \qquad (10)$$

The higher the values of c and h, the more rigid the real wages, i. e. RWR increases.

We estimate equation (8) for the period January 1997 – February 2000 (38 monthly observations[19] in total) in the form of type 1 differences (equation 11) because the series are first-order integrated

$$d(w-p)_t = \alpha_0 + \alpha_1 du_t + \alpha_2 du_{t-1} + \varepsilon_t, \qquad (11)$$

where

$$\alpha_1 = -c, \ \alpha_2 = ch$$

The results for equation (11) are as follows (t-statistics are given in brackets):[20]

$$d(w-p)_t = 0.01 - 0.71\,du_t + 0.56\,du_{t-1} + AR(1) + MA \qquad (12)$$
$$(8.39) \quad (-2.99) \quad (2.12)$$

$$R^2 = 0.60, \quad R^2 adj = 0.55, \quad DW = 1.87, \quad Prob\,(F) = 0.000$$

Thus $c = 0.71$, $h = 0.79$ and after substituting in (10) we obtain the real wage rigidity index (RWR)

$$RWR = \frac{1}{0.71(1-0.79)} = \frac{1}{(0.71)(0.21)} = \frac{1}{0.15} = 6.67$$

The average lag of unemployment response is $\dfrac{h}{(1-h)} = 3.8$ months.

The value of h showing inertia (hysteresis) can be derived directly from the autoregression equation for unemployment.

$$du_t = \beta_1\,du_{t-1} + \beta_t, \qquad (13)$$
$$where\ \beta_1 = h$$

The results are as follows:[21]

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[19] NSI data.

[20] It is interesting to note that the shortening of the period of observation (from April 1997, i.e. after the hyperinflation in February and March) does not result in changes in the values of the equation and the parameters examined. The dummy variable for January, February and March, which shows the dramatic decline in real wages, is insignificant.

[21] The model does not change if more unemployment lags and a constant ($du_t = \beta_0 + \beta_1 du_{t-1} + \beta_2 du_{t-2} \dots + \beta_n du_{t-n} + \varepsilon_t$) are included. Unemployment with one lag, i. e. the coefficient β_1 is the only significant value.

$$du_t = \underset{(5.78)}{0.77} \, du_{t-1}$$

$R^2 = 0.48$, $DW = 1.8$, Prob $(F) = 0.000$

That is, $h = 0.77$, which is close to the above value of $h = 0.79$.

Let's see the results from the BVAR model ($du, d(w\text{-}p)$) applied for the same period.[22] This model shows combined response to shocks (Chart 4) and the decomposition of real wage and unemployment variances (Chart 5).

Chart 4

COMBINED RESPONSES TO SHOCKS
(UNEMPLOYMENT U AND REAL WAGES W-P)

Response to One S.D. Innovations
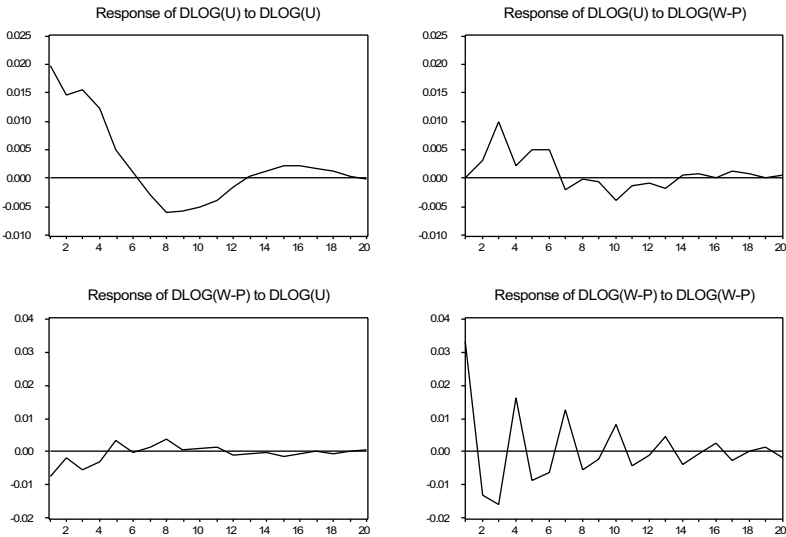
Weak real wage response to shocks on unemployment (lower left part of the chart) and strong unemployment inertia (upper left part of the chart) are evident.

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[22] The sequence of the variables in the VAR model is based on the assumption that flexible wages cause a rise in unemployment which, in turn, causes a decline in real wages ($u\uparrow \to (w-p)\downarrow$). This model can be used to derive the values of c and h, taking into account initial response and calculating the average lag of response. The optimum number of lags is four. It is possible to determine the sequence in the vector through a Granger causality test. We'd rather test a specific *a priori* formulated economic hypothesis, not a purely statistical one.

Decomposing variance (Chart 5) shows that about 80 – 90% of unemployment volatility is attributable to unemployment itself (upper left part of the chart) and an insignificant part of wage variance is due to unemployment dynamics (lower left part of the chart).

Chart 5

**VARIANCE DECOMPOSITION OF UNEMPLOYMENT U
AND REAL WAGES W-P**

Variance Decomposition
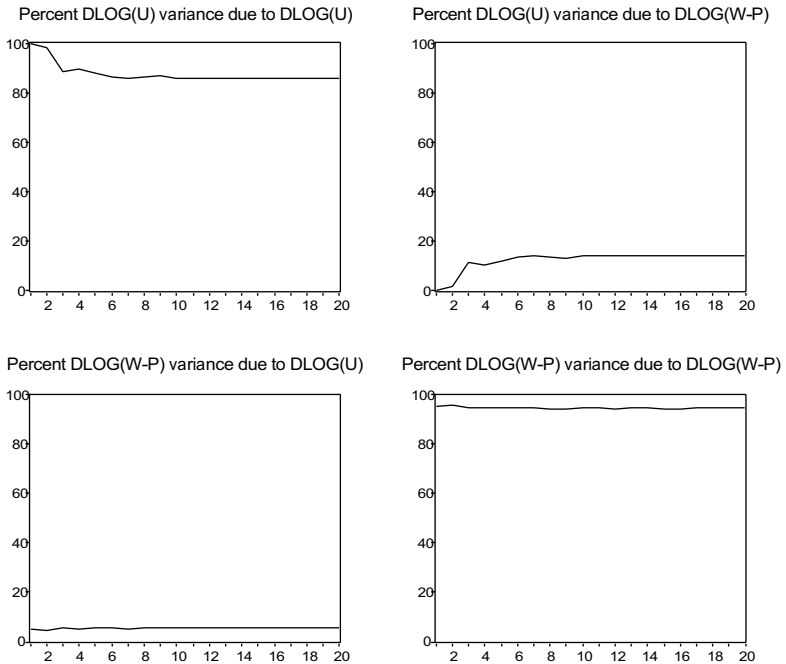
The optimum number of lags in the model is 4, and $\dfrac{h}{(1-h)} = 4$, then $h = 0.8$.

Overall, the low value of c and the high values of h and RWR and the parameters of the BVAR model suggest *low flexibility* of the LM in Bulgaria (no equilibrium values of real wages and employment are reached). Real wage movement cannot absorb different LM shocks. Rather this is possible through changes in unemployment, which is strongly inertial.

In fact, the lack of arbitrage between real wage growth and unemployment dynamics (modified Phillips curve) is visible graphically (Chart 6).

Chart 6

**RELATION BETWEEN REAL WAGE GROWTH AND
UNEMPLOYMENT GROWTH FOR THE PERIOD
JANUARY 1997 – FEBRUARY 2000**
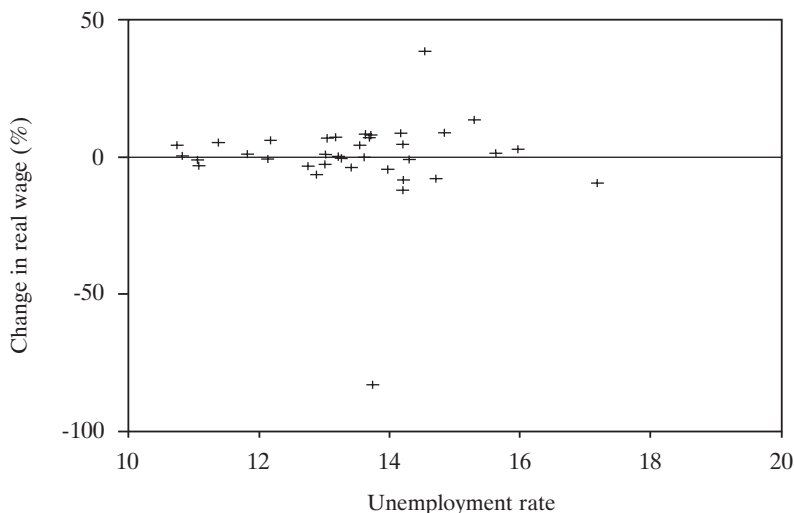
As the share of unemployed grows, real wages do not tend downward but even increase sometimes.

Let's apply the same method for the period before the CB introduction in Bulgaria to compare two radically different monetary regimes (discretion and rule). We apply the same approaches for the period April 1991 – September 1996 (73 monthly observations). The period under review ends with the beginning of the hyperinflationary period of late 1996.[23]

What strikes in the analysis of the discretionary central bank period is the missing relationship between real wages and unemployment. The coefficient c is either with a reversed sign[24] and statistically insignificant in equation (11), or tends to zero ($c \to 0$). It is noteworthy that the

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[23] The late 1996 and early 1997 period is of extreme nature as some sustainable trends in the behavior of economic agents reversed. In general, it may be argued that the monetary regime in the review period has not witnessed significant changes and may be determined as discretionary central bank, completely subordinated to the government.

[24] This means that unemployment growth leads to real wage growth.

value of h indicating unemployment inertia is almost equal to that prior to CB introduction ($h = 0.73$). In this case the rigidity index RWR is high and in certain cases tends to infinity.

$$RWR = \lim_{c \to 0}\left(\frac{1}{c(1-h)}\right) \to \infty \tag{14}$$

The following equation has the best statistical characteristics from those examined:

$$d(w-p)_t = 0.0001 - 0.002du_t + 0.0015du_{t-1} + AR(1) + AR(2) + MA(1)$$
$$(12.76)\quad(-1.68)\quad\;\;(2.12)$$

$R^2 = 0.38$, $R^2adj = 0.34$, DW = 2.02, Prob (F) = 0.000

Direct measuring of unemployment hysteresis (until CB introduction) produces good technical indicators:

$$du_t = 0.73\, du_{t-1}$$
$$(9.91)$$

$R^2 = 0.58$, DW = 2.12, Prob (F) = 0.000

The results from the BVAR model *(du, d(w – p))* applied for the period before CB introduction show strong real wage rigidity and high unemployment inertia (Charts 7 and 8).

Chart 7

**COMBINED RESPONSES TO SHOCKS
(UNEMPLOYMENT U AND REAL WAGES W-P), IV'91 – IX'96**

Response to One S.D. Innovations

Chart 8

DISCUSSION PAPERS
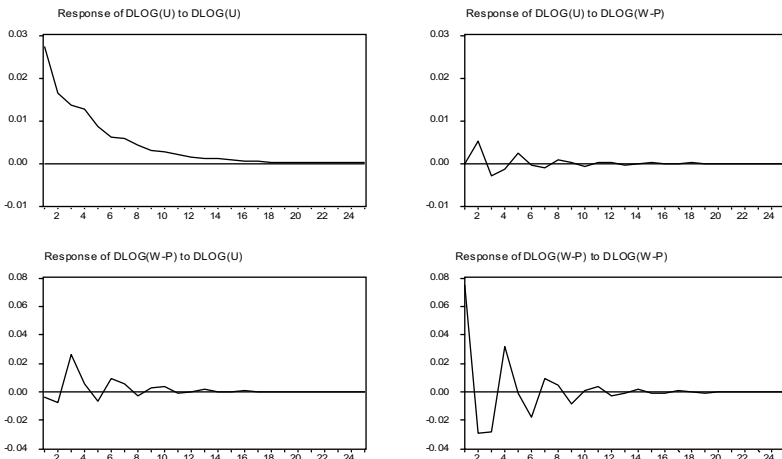
**VARIANCE DECOMPOSITION OF UNEMPLOYMENT
AND REAL WAGES , IV′91 – IX′96**

Variance Decomposition

Percent DLOG(U) variance due to DLOG(U)   Percent DLOG(U) variance due to DLOG(W-P)

Percent DLOG(W-P) variance due to DLOG(U)   Percent DLOG(W-P) variance due to DLOG(W-P)
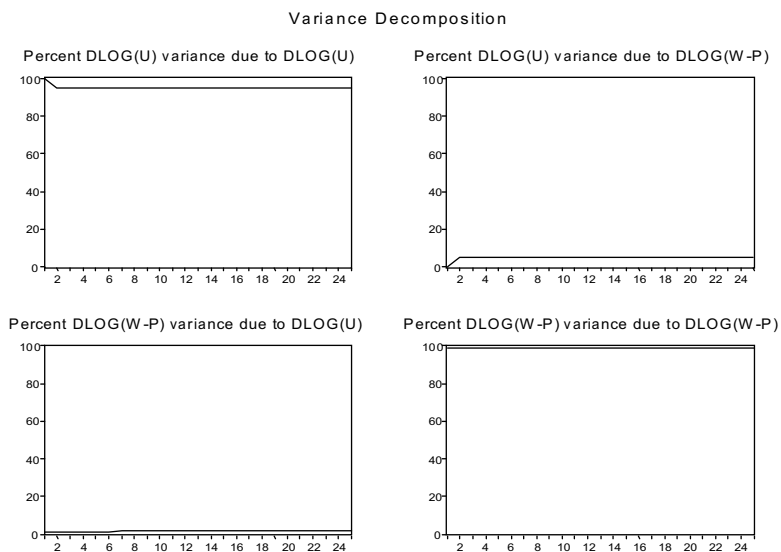
Therefore, it may be assumed that there was significant LM rigidity in Bulgaria both in the period of discretionary monetary policy and in the period preceding CB introduction. However, *real wage flexibility increased substantially (after CB introduction) in response to employment changes.* This confirms the assumption that a harder monetary regime (entailing lower subsidies from the government and limited possibilities for bank lending) disciplines state-owned enterprises and forces them to accept more flexible wage policies. Notwithstanding improvements, state sector labor redundancies remain the major source of LM adjustment. High inertia in unemployment dynamics confirms the hypothesis that it is first and foremost a structural phenomenon of transition (which is unavoidable) and monetary and fiscal injections have almost no effect on it; moreover, they are an obstacle to overcoming it.

Table 1, which presents the results for real wage rigidity index in the developed countries measured by *Viñals, J., J. Jimeno* (1998) and our results for Bulgaria, provides a basis for comparison. It shows that RWR is considerably higher than that in EU countries and decreases after CB introduction.

Table 1

**REAL WAGE RIGIDITY INDEX IN EU, USA, JAPAN,
AND BULGARIA (BEFORE AND AFTER CB INTRODUCTION)**

	Structural model estimates (wage and price equations)	BVAR model estimates (D(W-P),U) model
Bulgaria	Before CB ($\to \infty$)	Before CB ($\to \infty$)
	After CB (6.67)	After CB (17.77)
Belgium	0.25	2.86
Denmark	0.58	3.44
France	0.23	5.13
Germany	0.63	3.76
Ireland	0.27	2.92
Italy	0.06	4.29
Netherlands	0.25	2.11
Spain	0.52	4.20
Great Britain	0.77	3.43
Austria	0.11	4.49
Finland	0.29	9.55
Sweden	0.08	4.92
European Union	0.42	4.09
USA	0.25	2.39
Japan	0.06	2.21

Source: *for Bulgaria (authors' calculations), and for the other countries − Layard, R., S. Nickell, R. Jackman (1991, pp. 406 − 407) − structural model, Viñals, J., J. Jimeno (1998, p. 23) − VAR models.*

VAR Model Estimating the Impact of Unemployment and Real Wage Rigidity on Fiscal Reserves, Reserve Money and Interest Rate Behavior (after CB introduction)

In their research study *Berthold, N., R. Fehn, E. Thode* (1999) make a comparative analysis for EU countries of the relation between unemployment, real wages and major adjustment channels. Fiscal policy is approximated with total government liabilities and monetary policy, with short-term interest rates. The authors' main task is to trace how real wages accommodate unemployment-driven shocks, the government response (fiscal policy), and the central bank response (short-term interest rates).

Table 2

REAL WAGE RIGIDITY INDEX IN EU, USA, JAPAN, AND BULGARIA

	BVAR (D(W-P), DU) model estimates
Bulgaria	Before CB ($\rightarrow \infty$)
	After CB (14.30)
Belgium	1.42
Denmark	1.10
France	1.58
Germany	1.48
Ireland	1.68
Italy	1.00
Netherlands	1.52
Spain	1.94
Great Britain	1.16
Austria	0.85
Finland	1.71
Sweden	1.41
European Union	1.39
USA	0.73
Japan	0.89

Source: *for Bulgaria (authors' calculations), and for the other countries − Layard, R., S. Nickell, R. Jackman (1991, pp. 406 − 407) − structural model, Viñals, J, J. Jimeno (1998, p. 24) − VAR models.*

In the case of Bulgaria, we modify this approach by assuming that government fiscal reserves at the BNB Issue Department reflect the state and movements in government revenues and expenditures, which impacts both reserve money and the interbank money market interest rate. In this configuration the model would look as follows:

$$VAR\ (du, d\,(w\text{-}p), dg, dh, di\ ), \tag{15}$$

where u is logarithm of unemployment, *w* is logarithm of nominal wages, *p* is logarithm of CPI, *g* is logarithm of government fiscal reserves, *h* is logarithm of reserve money, and *i* is logarithm of interbank interest rate (where it is added to unity to obtain the variable in logarithm) and variables are first-order integrated.

Chart 9

**RESPONSES OF FISCAL RESERVES (*G*), RESERVE MONEY (*H*)
AND INTEREST RATE (*I*) TO SHOCKS ON LM (*U* AND *W-P*)**

Response to One S.D. Innovations
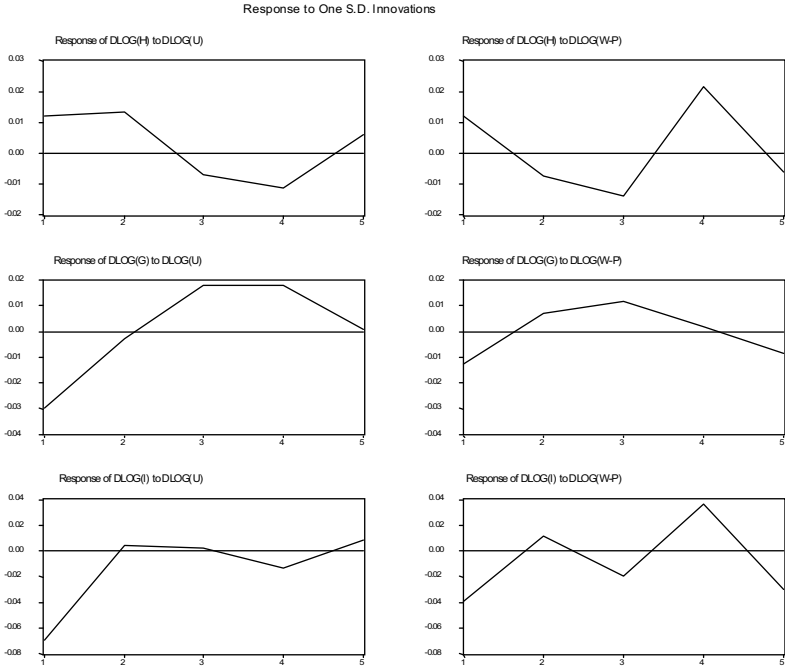
As Chart 9 shows, there is no clearly pronounced direction of economic policy response (conscious or unconscious) to unemployment and real wage growth. For instance, unemployment growth (*u*) initially leads to reduced fiscal reserves (i. e. higher government spending), reserve money growth and lower interest rate. This is a clearly pronounced automatic buffer to absorb shocks on LM. However, *g, h* and *i* behaviors change their direction as a result of the CB automatic mechanism. This points to more or less automatic response and unconscious policy rather than result-oriented government response. The responses of *g, h* and *i* to real wage growth is similar, though their dynamics should move in the opposite direction to offset the negative impact of real wage growth.

Panel Model Showing Employment Dynamics Response to Real Wage Changes for the Period January 1998 – December 1999 in 38 Industries (Form B40[25])

In this model, we examine the relation between changes in the number of labor force and real wage changes after CB introduction.[26]

The model is:

$$\text{dlog}\left(\dot{N}_{it}+1\right) = \text{B}_{it} + \text{B}_{1i}\,\text{dlog}\left(\left(\frac{\dot{W}}{P}\right)_{it}+1\right) + \text{B}_{2i}\,\text{dlog}\left(\left(\frac{\dot{W}}{P}\right)_{it-1}+1\right) +$$

$$+ \text{B}_{3i}\,\text{dlog}\left(\dot{N}_{it-1}+1\right) + \text{e}_{it} \tag{16}$$

where i denotes industry $i = 1, 2, \ldots, 38$, $\dot{N}$ is the rate of change of the number of employed, and $\dot{W}/P$ is the rate of change of real wages by industry (W are nominal wages and P is CPI).[27]

According to the theoretical hypothesis proposed, LM is flexible when: (a) employment dynamics responds to changes in real wages (β_1 and β_2 are significant) and (b) elasticity between employment growth and real wage growth may be either positive or negative (the signs of β_1 and β_2 may be either negative or positive). In recession and output slump in all industries the signs should be negative and vice versa: in overall upswing, they should be positive. Naturally, individual industries would respond differently depending on economic conditions and on whether these are advanced industries or industries with subsiding functions.

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[25] See the Appendix.

[26] According to *Blanchard* (1997), an interesting approach to the analysis of LM flexibility is to examine the elasticity of wages and employment in terms of changes in corporate sales. This theoretical approach assumes that under given hard budget constraints companies face the trade-off to offset changes in their sales either through labor prices (wages) or through labor volume (number of employed). Similar studies were done for Poland and Hungary for the period 1991 – 1992 using panel models. The results from these studies show that companies in Hungary and Poland are inclined to reduce wages as sales decrease (to a much greater extent than developed countries) rather than fire employees. Companies' behavior is asymmetric to decreasing or increasing sales: as sales decrease companies do not discharge employees while as sales increase they rarely employ new personnel. A similar study could be done for Bulgaria to examine whether companies respond through employees or through wages to changes in their sales. Unfortunately, industry breakdowns by employed and wage do not match breakdowns of sales revenues and modeling is impossible.

[27] Adding unity to the rates of change in employed and real wages does not alter the result. This is due to the impossibility to estimate negative values in logarithm.

In Appendices 1 and 2 are presented Panel Models 1 and 2. Their characteristics in general show that employment dynamics is not sensitive to changes in real wages. Model 1 has relatively good characteristics (coefficient β_1 is significant and negative) and $R^2 = 0.14$, the latter being a relatively satisfactory figure for a panel study. According to this model, as real wages grow (due either to nominal wage growth or lower CPI[28]) companies respond by firing personnel.

Model 3 in Appendix 3 presents the relation studied for 38 industries. The results are interesting. LM is elastic (according to our theoretical hypothesis) in the following industries: commerce, hotels and restaurants, construction, paper and printing industries, food and tobacco industries, leather and fur industry, real estate services, financial intermediation, manufacture of chemicals and their products. In these industries the sign of β_1 is negative and the coefficient is significant. This can be interpreted as employment decline as a result of real wage growth.

The following industries are characterized by rigidity: most of the heavy industries, gas and petroleum industries, health care, education, research and development, public administration, etc. It is of note that private companies and entrepreneurship dominate in the more flexible industries while state-owned companies dominate in industries with rigid LM. In these industries the sign of β_1 is positive but in most cases the coefficient is not significant.

Overall, the hypothesis of a flexible LM in the private sector and a rigid one in the state sector is confirmed.[29]

Relation between Private Sector Wages and State Sector Wages

In section three, we presented theoretical assumptions of the relation between LM in the private and state sectors. Here we present some empirical data on the relation between wages in the two sectors.

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[28] It may be assumed that real wage dynamics is affected more significantly by price movements than by nominal wages.

[29] Panel modeling of the relation between employment dynamics and wage dynamics separately for private and state sectors (data are available) allows for testing the hypothesis. This could be a subject of a possible further study.

Chart 10

DYNAMICS OF PRIVATE SECTOR WAGES (DECLARED) AND STATE SECTOR WAGES (JANUARY 1998 – JUNE 2000)
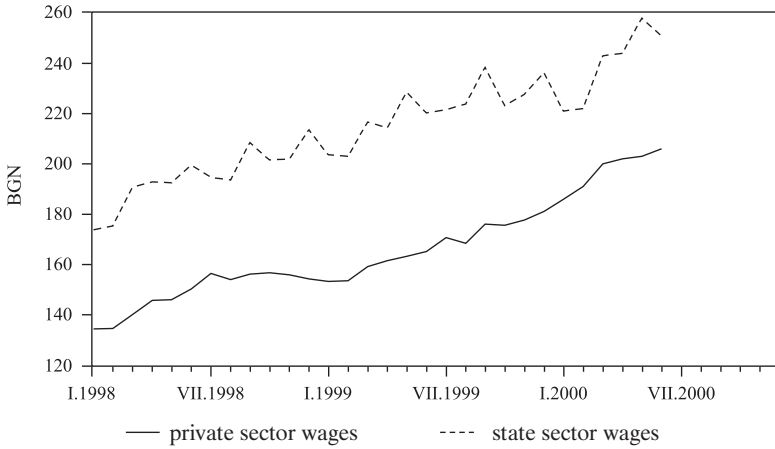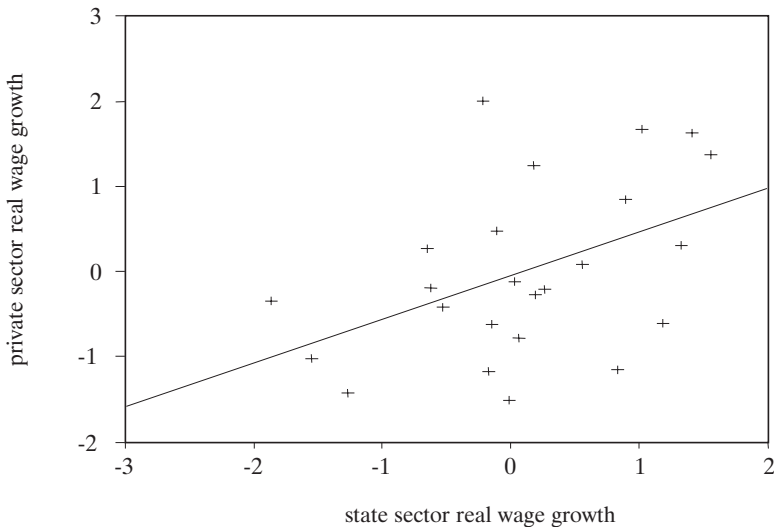

private sector wages   state sector wages

Chart 11

RELATION BETWEEN PRIVATE SECTOR REAL WAGE (DECLARED) GROWTH AND STATE SECTOR REAL WAGE GROWTH (JANUARY 1998 – FEBRUARY 2000) – NORMALIZED SCALE

Charts 10 and 11 show a trend of parallel movement in declared private and state sector real wages (though, as we pointed out, declared wages in the private sector do not reflect actually paid wages). The correlation between wages in the two sectors is 0.9 and the correlation between their growth rates is 0.5.[30]

Additional elements of LM flexibility could come from the dynamics of the undeclared portion of private sector wages, which serve as a buffer to absorb possible shocks on aggregate demand and supply. This could explain the difference between the high correlation between wage levels in the two sectors and the correlation between their growth rates.

Some Institutional Aspects of Wage Setting in Bulgaria

Wage setting in Bulgaria (in both sectors, state and private) reflects directly the legally mandated role of the government in the field of labor relationships. As in the former Labor Code, the new Labor Code (ZIDKT)[31] states: "The government shall regulate labor and labor-related relations, social security relations and issues concerning the standard of living" (Article 2, see the same text in Article 3, para. 1).

Wage setting in both sectors (state and private) is effected within the framework of the so-called Tripartite Cooperation, including representatives from the government, employers and trade unions (representatives of employees or all employees as a whole).[32] Eventual and final solution of the issues is subject to approval by government authorities. ZIDKT provides for the functioning of tripartite cooperation councils at three levels: national, sectoral (industry) and municipal councils. Interestingly enough, these councils are financed from government and municipal budgets, i.e. tripartite cooperation councils are financially dependent on the government (Article 3e, para. 2).

Wage bargaining is conducted at two levels: sector (industry) and company.[33] Collective labor agreements (CLA) can be defined as

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[30] The parallel movement of the two types of wages gives a certain ground for common interpretation for both sectors of the already estimated real wage rigidity index in the state sector as well as our LM elasticity panel study (where aggregated data on the two sectors were used).

[31] KNSB (1992), Labor Code; State Gazette (2001), Amendment to Labor Code (ZIDKT). In retrospective, labor regulation was provided for by the Labor Code adopted in 1986, which has been amended repeatedly since 1992.

[32] "The government administers unnecessarily a free and democratic process as social cooperation" (*Georgieva, M*., 2000).

[33] For details, see the analysis in *Georgieva, M*. (2000). The new provisions of ZIDKT introduce the principle of administrative-territorial collective labor bargaining, a positive

asymmetric as they mandate more powers (and less responsibilities) to employees than to employers. This asymmetry is inherited from the past when companies were state-owned and agreed on inflated wages and bonuses. Currently, bonuses still account for 25 to 30% of basic wages.[34] Bulgarian economists also recognize that sectoral collective bargains are inconsistent with modern realities. According to D. Tabeian: "enterprises within an industry display different socioeconomic indicators. We cannot determine a minimum wage for an industry both for a prosperous enterprise and an enterprise facing failure." (*Georgieva, M.*, 2000). Moreover, industry and sectoral wage setting in Bulgaria reflects the specifics of 'rough' sectoral formation, for example combining together petrochemists, chemists and pharmaceutists, mechanical and electrical engineers.

A major violation of the principle of voluntary employment is the obligation that all employers are subject to CLA clauses even when they are not members of industrial and sectoral organizations that have signed the agreements. Moreover, if an employer decides to leave a given employer organization, he is obliged to continue fulfilling the obligations undertaken by the organization in compliance with the CLA, according to Article 55, para. 1 of currently effective Labor Code. While employers are obliged to undertake collective bargaining, trade unions have an option to do so. Collective labor agreements could be signed by enterprise, sector, industry, profession and administrative-territorial unit.

Determination of the *minimum wage for the country* and the types of minimum limits for bonuses and compensations under labor contracts are of key importance. The Council of Ministers is empowered to do this, exercising the right within the tripartite cooperation after consulting with trade unions and employer organizations. Conditions under *individual labor contracts* cannot be less favorable than those prescribed in the CLA, and if no such agreement is signed, by the conditions as declared by the Council of Ministers.

Generally, the legal framework of LM in Bulgaria gives a clear idea of the principle of its organization:

(1) Minimum wage bargaining is centralized and the government plays a central role.

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step that converges to a certain extent to the European trend in wage setting, which takes account of regional specifics.

[34] See *Georgieva, M., B. Kolev*, 2000.

(2) Through CLA, higher than natural wage levels are negotiated and there is a clearly pronounced trend toward their setting on industry principle. The existing practice of including representatives from different professions and enterprises with different socioeconomic indicators in the CLA for a given industry makes its implementation pointless.

(3) The government interferes implicitly by delegating great power to trade unions. Similarly, the government influences big associations of employers while strengthening its position through the formation of small artificial employer organizations.

(4) The individual labor agreement is of fictitious nature for the employee as he/she is protected sufficiently by the respective industry union and the employer is forced under CLA to pay him/her a wage that is not tied in any way with labor rates and productivity and may be higher than the equilibrium level.

(5) Labor legislation in Bulgaria (CLA in particular) grants more rights to employees than to employers (the theory of the weak partner). Employer participation in collective bargaining has adverse effect on his business, leading to worsened competitiveness (outflow of human capital) and financial position.[35]

(6) Compared with the former Labor Code, the amended Labor Code (ZIDKT) provides for reduced labor market flexibility and enhanced employee role. The attachment to the draft that was brought in for consideration by parliament (National Assembly, 2000) states the need to remove "the vicious practice of chained term labor contracts." According to the currently effective ZIDKT, a term labor contract may be extended only once and for a term of not less than one year (see Article 68, para. 3). The following text is eloquent: "Labor legal relation with a worker or employee shall not be terminated upon: enterprise acquisition, enterprise merger, enterprise split into several enterprises, transfer of an individual part of an enterprise to another enterprise, *change of enterprise ownership* or an individual part thereof, lease of an enterprise or an individual part thereof, rent or concession" (Article 123, para. 1). Then the question arises: what market economy is this that prohibits the new owner to restructure his business? This, in the conditions of a currency board! Moreover,

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[35] For a detailed comment on the issues arising from CLA, see *Georgieva, M.* (2000). According to employers polled by the author, clauses agreed on in CLA concerning additional social and other benefits "create conditions for unreasonable spending and financial collapse of the enterprise."

ZIDKT states that employees have "the right to timely, reliable and understandable information on the economic and financial state of the employer" (Article 130, para. 1)![36]

In general, centralized and industry wage setting, to a certain extent, dominate in Bulgaria. Industry wage setting is probably the worst configuration. For if something is certain in the context of wage setting, definitely industry formation does harm the smooth operation of the CB. Within EU framework, modern trends tend toward transition to individual and regional wage setting.[37]

Finally, in section five we examine the euro as a way to solve the CB credibility problem and its impact on CB state.

Bulgaria's Integration into the European Monetary Area and Euro Introduction: A Way to Solve the Problem with CB Credibility and Enhance Labor Market Flexibility

A Brief Recount of the Discussion on Optimum Currency Areas (OCA)

As we pointed out, real exchange rate flexibility needed in the event of asymmetric shocks on aggregate demand and supply was (and still is) considered one of the traditional criteria for OCA formation. When the nominal exchange rate is fixed or a common currency is adopted, adjustments should come through movements in nominal wages and/or price levels in the countries within the area. Otherwise, unemployment in the country affected by a negative shock would grow. The shock could be absorbed if there is strong labor mobility within the area (this is according to Robert Mundell's classical theory of OCA). One of Mundell's basic arguments against fixed exchange rates and common currency formation is restricted labor mobility between the countries participating in the monetary regime.[38] Weak labor mobility within the EU was and still is

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[36] And why not vice versa?

[37] Currently, centralized wage setting still exists in the EU, though with subsiding functions, while wage setting by industry is doomed to be finally removed.

[38] For example, Mundell assumes that a negative shock on aggregate demand in a given country would bring about unemployment that cannot be overcome. Therefore, the country should have its own currency in order to devalue it and restore demand. This argument can be reduced to the absurdity that each producer or economic agent could have his own currency to be able to devalue it and improve the relative prices of his products. For example, there would be no logical obstacles for the region of Kardjali, which is relatively isolated from the other regions in the country, to introduce its own money. Robert Mundell himself proposes that the USA be split into two geographic areas with their own currencies.

one of the main arguments against the formation of a common currency and monetary policy centralization (*Feldstein, M.*, 1992), underpinned by the famous research in *Blanchard, O., L. Katz* (1992, 1999). According to their research, labor mobility between different US regions is considerably higher than in the EU, and unemployment dispersion is higher in the EU than in the USA.

In 1993, Paul Krugman formulated a new argument against OCA stability. According to him, the common area brings about specialization growth in countries and regions, which, in turn, leads to higher vulnerability to asymmetric shocks. Thus, integration brings about a reverse trend of self-destruction and a return to floating rates and national money. In actual fact, Krugman's approach aims to show the existence of two opposite trends leading to two different equilibria (both unstable), (*Krugman, P.*, 1993). Actually, this idea is not Krugman's as it is present already in the *Wealth of Nations*, where Adam Smith emphasizes that division of labor leads to the emergence of common (metallic) money and specialization growth, and hence the desire of different groups of producers to lower the gold content in money and form their own money to boost production (to improve the relative prices of their products). It should be noted that in the late 60's Peter Cannon had already formulated almost the same OCA criterion according to which high trade diversification of a country is a good reason to join a common monetary regime.[39] The approach of *endogenous* formation gained ground in response to criticism regarding difficulties in OCA formation. In our opinion, this approach has two aspects that need be differentiated clearly.

The first is fundamental and purely methodological. The theory of OCA can be viewed as a product of assuming economic theory and policy as a conscious process of constructing a certain reality and a possibility to choose tools in order for the state to aim at multiple targets. 'Optimality' is a category of exact sciences and is wrongfully applied to economic processes. In this line of reasoning, the optimum area cannot be evaluated and measured in advance, for it is not a social engineering product. The formation of a common monetary regime is an endogeneous outcome of economic agents' activity and a spontaneous discovery. Therefore, it may be assumed that OCA-related problems are artificially created to a great extent. This is confirmed by the fact that difficulties in finding its theoretical fundamen-

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[39] The third approach to OCA was formulated by Ronald McKinnon and is linked to the requirement for open economy.

tals have existed for over 40 years. In 1984, Niehans voiced his concern (*Niehans, J.*, 1984) and 20 years later progress in the theory of OCA has stalled despite the great number of technical exercises.

Figure 3

INTEGRATION, SPECIALIZATION AND ASYMMETRIC SHOCKS
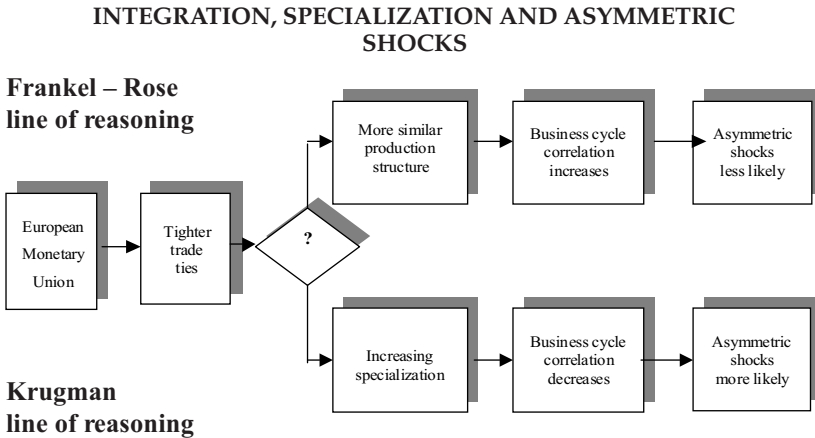
Source: Soltwedel, Dohse and Krieger-Boden, 1999, p. 49.

The second aspect of the analysis is purely technical. It is an issue of empirical evidence of the reversed causality between 'common' money and integration (money is no longer a consequence but a condition for the formation of a common economic and financial area). An example of this line of reasoning is the article by *Frankel, J., A. Rose* (1996) assuming a reversed logical chain compared with Krugman's, namely: common money ⟶ intensified trade within the area ⟶ greater convergence between production structures ⟶ synchronization and stronger correlation between business cycles in individual countries and regions ⟶ lower probability of asymmetric shocks.[40] The choice between the two types of 'technical' reasoning is reduced to testing empirically whether specialization within the EU is increasing or decreasing.

Euro Adoption and the Labor Market in Bulgaria[41]

Whether we argue in the context of traditional OCA concepts or in the context of their endogeneity, adoption of the euro in Bulgaria has more advantages than disadvantages in terms of LM.

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[40] See also *Frankel, J.* (1999).
[41] We are not concerned with the issue of when and how Bulgaria will adopt the euro. We assume that this will happen at a certain point in the future.

(1) As we saw, Bulgarian LM is rigid and lacks the flexibility that is needed in a CB arrangement and fixed exchange rate. Unemployment growth in Bulgaria exacerbates the credibility problem (the temptation to devalue grows). Euroization resolves radically the issue of CB credibility, eliminating the object of a possible attack: the national currency.

Chart 12

HYPOTHETICAL RELATION BETWEEN MONETARY REGIME AND LABOR MARKET
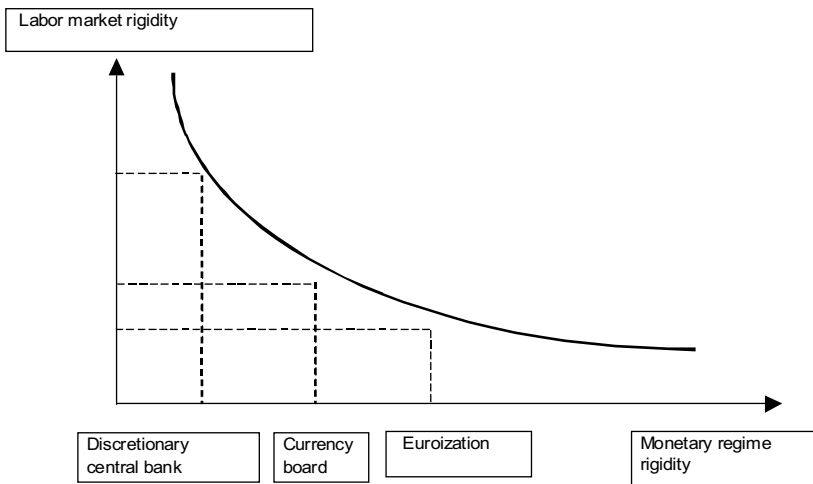
(2) We saw that the real wage rigidity index decreases after CB introduction. A tighter monetary regime and stricter fiscal policy requirements make LM more flexible. In a way, they serve as a constraint. Being an even tighter monetary regime, it may be assumed that euroization would provide the next, needed impulse for higher LM flexibility. In this sense, things are reversed: LM rigidity is not a threat under a rigid monetary regime but vice versa: a rigid monetary regime is a condition for LM liberalization. The relation between monetary regimes and LM flexibility can be presented graphically (see Chart 12).

(3) Euro adoption as legal tender will force decision-makers to change LM institutional fundamentals. Naturally, we should move to decentralized wage setting linked to the principle of

subsidiarity[42] (as is the trend in EU Member States), taking into account regional and enterprise specifics. Importantly, a focus should be placed on wage setting at regional level to ensure better reporting of the labor productivity level (to avoid imitation of richer regions in wage setting).

Probably households would welcome labor legislation liberalization more easily. This will reduce to minimum unemployment benefits and will eliminate the minimum wage[43] and a number of other transfers, which inhibit labor mobility and increase the moral hazard. Pension and social security systems might be reformed. As EU and US experience shows, liberalization in the other markets (especially the real estate market) has an equally strong effect on enhancing LM flexibility.

In general, institutional freedom[44] is needed for the formation of different configurations of labor contracts at all levels, including individual regions and firms. In addition, liberal LM institutional structure (low unemployment benefits, low or no minimum wage, easy layoff procedure) is crucial to faster government sector restructuring and privatization (*Garibaldi, P., Z. Brixiova*, 1997).[45]

(4) There are grounds for assuming that euroization will create more trade flows between Bulgaria and the EU than would divert outside of the EU. The process of trade flow creation, coupled with recent reliefs for Bulgarian citizens traveling abroad, as well as some trends toward encouraging entry of foreign workers and employees (e.g. the recent decision on accepting computer specialists in Germany[46] and the forecast of the European Council

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[42] The principle of subsidiarity means that only those problems will be solved at a higher hierarchical level that cannot be solved or it is more expensive to be solved at a lower level.

[43] According to Prof. G. Petrov, the minimum wage has a more important role in hiding taxes and social payments.

[44] Competition between LM institutions may be viewed as a discovery in the spirit of Friederich Hayek and Isreal Kirsner. When there is no institutional freedom in the monetary field, this should be compensated in other parts of the economic system.

[45] It is not by chance that in their proposals for LM liberalization within EU (published by the IMF) the three German economists from the Institute for World Economy in Kill refer explicitly to Hayek's studies (*Soltwedel, R., D. Dohse, C. Krieger-Boden*, 1999). In two consecutive papers *Calmfors, L.* (1998, 1998a) presents a model for EU monetary policy, which besides traditional deviations from inflation and unemployment targets includes an indicator of LM institutional liberalization implementation in the loss function of the government. A similar parameter was used in the ECB function. The author concludes that more serious LM institutional reforms are needed in candidate countries than in eurozone member countries.

[46] A similar proposition is being discussed in Italy.

that 50 – 70 million immigrants to the EU will be needed within the next 40 – 50 years[47]) would enable a great number of Bulgarians to find jobs in EU countries. This would reduce the number of unemployed in Bulgaria both in terms of redundancies and directly through unemployment decline. As we pointed out, it may be expected that educated persons would accept less paid jobs in EU countries. Sociological studies show that Bulgarians possess high potential mobility. According to these studies, the majority of the young generation in Bulgaria rather prefers to emigrate and work abroad, mainly in EU countries.

Let's consider the issue from EU point of view. In a series of studies the German economist *Hans-Werner Sinn* (1996, 1999, 1999a, 2000) argues that the EU and Germany are also interested in importing workers from candidate countries, for this would increase the efficiency and competitiveness of the European economy. Inflow of workers from the new countries would make LM within the EU more flexible in the conditions of common monetary policy and strict fiscal policy community requirements for growth and stability.

According to him, the best solution (fist order optimum, as he calls it) requires not only complete removal of the barriers to labor mobility within the EU but also a significant restriction of transfers to future members to ensure protection against migration waves. According to the *Hans-Werner Sinn* model, after a certain period of time the migration flow would return to the new countries. This is the only market-efficient solution to the issue of optimum distribution of resources within the EU (labor, capital and technology). This is the lesson from the unification of East and West Germany.

Inflow of foreign workers would help overcome the threat to the pension systems in most EU countries, which face challenges associated with changes in the population pyramid.[48]

All this gives ground for assuming that euro adoption in the future would have a positive effect both on real wage flexibility and unemployment dynamics, and problems arising from the rigidity of the Bulgarian LM and its impact on CB stability would be reduced.

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[47] *Hargreavs, D*. (2000), Brussels eyes immigration targets, *Financial Times* (22/11/2000).

[48] To maintain the state of the German pension system in 2030 at the same level 11 million immigrants will be needed at that time, provided that present life expectancy is preserved.

Conclusion

The results from the study can be summarized as follows:

(1) LM rigidity poses a serious threat to any rule-based monetary regime. The harder the monetary regime, the more urgent the LM liberalization. In the case of a currency board, the unemployment – devaluation trade-off is at the heart of the problem with monetary authorities credibility.

(2) Real wage flexibility is a major condition for absorbing possible shocks in the economy under a static central bank and a key element in the automatic adjustment mechanism of the currency board.

(3) In the analysis of LM, the dynamics and the relationship between the restructuring state sector and the new, private sector play an important role. There are sufficient empirical grounds for assuming that the private sector segment of LM is flexible while the state sector one abounds in imbalances and restrictions.

(4) A hypothesis may be stated of an illusory, quasi-unemployment in Bulgaria, related to the difference between actual and declared wages in the private sector. The difference is largely due to non-liberal legal framework of labor relations in Bulgaria, providing many rights and few responsibilities to employees and workers and considerable powers to the government to interfere in labor contracts (through the CLA system).

(5) Empirical studies and models show that real wages in Bulgaria are much more rigid than in EU countries. After CB introduction and fixing the exchange rate real wage flexibility increased considerably. Flexibility dynamics confirms the hypothesis that a harder monetary regime serves as a coercion on LM liberalization (i.e. a feedback effect exists).

(6) Real wage rigidity leads to accumulation of imbalances and conscious (or not) absorption of the shocks on unemployment through fiscal reserves, reserve money, money stock, etc.

(7) In the constructed panel model real wages are flexible in the following industries: commerce, hotels and restaurants, construction, paper and printing industries, food and tobacco industries, leather industry, real estate services, financial intermediation, manufacture of chemicals and their products. The following industries are characterized by rigidity: most of the heavy industries, gas and petroleum industries, health care, education, re-

search and development, public administration, etc. It is of note that private companies and entrepreneurship dominate the more flexible industries while state-owned companies dominate industries with rigid LM.

(8) Wage setting in Bulgaria is at variance with modern EU trends. It is necessary to shift toward a decentralized wage setting system. Introduction of the system of term contracts would be an important step in reorienting Bulgarian labor legislation from one providing employee protection to modern liberal legislation where the personal choice of the parties to the labor contract, the employer and the employee, will be dominant. Regretfully, ZIDKT not only does not enhance LM flexibility but in many respects is a step backward in comparison with the former Labor Code.

(9) Finally, Bulgaria's accession to the EU and euro adoption requires liberalization of the LM. On the other hand, accession and euro adoption will serve as a basis for enhancing LM flexibility and will mitigate unemployment and poverty problems. According to a number of studies on free labor mobility between Eastern Europe and EU countries, the latter will also benefit from this, i.e. this is a kind of first order optimum from the point of view of both labor markets.

Appendices

Appendix 1. Panel Model 1

Dependent Variable: DLOG(GN?+1)
Method: Pooled Least Squares
Date: 09/18/00   Time: 16:41
Sample(adjusted): 1998M02 1999M12
Included observations: 23 after adjusting endpoints
Number of cross-sections used: 38
Total panel (balanced) observations: 874

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.003758	0.001433	-2.622500	0.0089
DLOG(GRW?+1)	-0.149445	0.012685	-11.78142	0.0000

R-squared	0.137318	Mean dependent var		-0.005157
Adjusted R-squared	0.136329	S.D. dependent var		0.045434
S.E. of regression	0.042224	Sum squared resid		1.554641
F-statistic	138.8017	Durbin-Watson stat		1.701869
Prob(F-statistic)	0.000000			

Appendix 2. Panel Model 2

Dependent Variable: DLOG(GN?+1)
Method: Pooled Least Squares
Date: 09/18/00   Time: 16:37
Sample(adjusted): 1998M03 1999M12
Included observations: 22 after adjusting endpoints
Number of cross-sections used: 38
Total panel (balanced) observations: 836

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.000790	0.000795	-0.993795	0.3206
DLOG(GRW?+1)	-0.010474	0.009267	-1.130242	0.2587
DLOG(GRW?(-1)+1)	-0.009847	0.008402	-1.171984	0.2415
DLOG(GN?(-1)+1)	-0.049200	0.019257	-2.554902	0.0108
R-squared	0.008004	Mean dependent var		-0.000633

Adjusted R-squared	0.004428	S.D. dependent var		0.022835
S.E. of regression	0.022784	Sum squared resid		0.431900
F-statistic	2.237823	Durbin-Watson stat		2.379402
Prob(F-statistic)	0.082443			

Appendix 3: Panel Model 3

Dependent Variable: DLOG(GN?+1)
Method: GLS (Cross Section Weights)
Date: 09/18/00   Time: 13:54
Sample: 1998M02 1999M12
Included observations: 23
Number of cross-sections used: 38
Total panel (balanced) observations: 874

Variable	Coefficient	Std. Error	t-Statistic	Prob.
_1–DLOG(GRW_1+1)	0.051106	0.040854	1.250918	0.2113
_11–DLOG(GRW_11+1)	-0.132663	0.028437	-4.665087	0.0000
_10–DLOG(GRW_10+1)	0.587045	0.164554	3.567499	0.0004
_13–DLOG(GRW_13+1)	-0.093153	0.032359	-2.878742	0.0041
_12–DLOG(GRW_12+1)	-0.016594	0.009363	-1.772331	0.0767
_14–DLOG(GRW_14+1)	-0.104485	0.041082	-2.543332	0.0112
_15–DLOG(GRW_15+1)	-0.032961	0.034784	-0.947598	0.3436
_16–DLOG(GRW_16+1)	0.005878	0.020350	0.288845	0.7728
_17–DLOG(GRW_17+1)	-0.256722	0.113131	-2.269238	0.0235
_18–DLOG(GRW_18+1)	-0.060114	0.089040	-0.675139	0.4998
_21–DLOG(GRW_21+1)	-0.000593	0.003161	-0.187576	0.8513
_20–DLOG(GRW_20+1)	-0.269051	0.149340	-1.801602	0.0720
_2–DLOG(GRW_2+1)	0.043061	0.077184	0.557902	0.5771
_19–DLOG(GRW_19+1)	-0.101148	0.075988	-1.331107	0.1835
_22–DLOG(GRW_22+1)	-0.463173	0.073922	-6.265668	0.0000
_23–DLOG(GRW_23+1)	-0.538964	0.029433	-18.31159	0.0000
_24–DLOG(GRW_24+1)	-0.411349	0.124575	-3.302025	0.0010
_25–DLOG(GRW_25+1)	-0.078817	0.040913	-1.926455	0.0544
_26–DLOG(GRW_26+1)	-0.001584	0.015780	-0.100365	0.9201
_27–DLOG(GRW_27+1)	-0.127211	0.038725	-3.284964	0.0011
_28–DLOG(GRW_28+1)	-0.331886	0.117183	-2.832200	0.0047
_29–DLOG(GRW_29+1)	0.091685	0.126032	0.727469	0.4672
_3–DLOG(GRW_3+1)	0.006462	0.024612	0.262565	0.7930
_30–DLOG(GRW_30+1)	-0.522363	0.134566	-3.881832	0.0001
_31–DLOG(GRW_31+1)	-0.055233	0.080598	-0.685292	0.4934
_32–DLOG(GRW_32+1)	-0.003154	0.009540	-0.330661	0.7410
_33–DLOG(GRW_33+1)	-0.027312	0.025634	-1.065426	0.2870
_34–DLOG(GRW_34+1)	0.037692	0.095114	0.396284	0.6920
_35–DLOG(GRW_35+1)	0.141328	0.134587	1.050088	0.2940
_36–DLOG(GRW_36+1)	-0.018491	0.191557	-0.096533	0.9231
_37–DLOG(GRW_37+1)	0.018744	0.050096	0.374167	0.7084
_38–DLOG(GRW_38+1)	-0.000808	0.052641	-0.015358	0.9878
_4–DLOG(GRW_4+1)	-0.053077	0.033170	-1.600155	0.1100
_5–DLOG(GRW_5+1)	-0.006367	0.022865	-0.278479	0.7807
_6–DLOG(GRW_6+1)	-0.179588	0.042067	-4.269134	0.0000
_7–DLOG(GRW_7+1)	0.016667	0.028280	0.589351	0.5558
_8–DLOG(GRW_8+1)	0.225684	0.221646	1.018215	0.3089
_9–DLOG(GRW_9+1)	0.125217	0.083162	1.505695	0.1325

Fixed Effects

_1–C	-0.003418
_11–C	-0.001452
_10–C	-0.005804
_13–C	-0.002417
_12–C	-0.000782
_14–C	-0.004706
_15–C	-0.001741
_16–C	-0.002223
_17–C	-0.005330
_18–C	-0.003162
_21–C	-0.000600
_20–C	-0.005880
_2–C	-0.001485
_19–C	0.000180
_22–C	-0.003779
_23–C	-0.000513
_24–C	-0.009610
_25–C	-0.002544
_26–C	-0.001530
_27–C	-0.001250
_28–C	-0.008193
_29–C	-0.000219
_3–C	-0.000747
_30–C	-0.013497
_31–C	-0.003399
_32–C	-0.000254
_33–C	-0.001252
_34–C	0.005865
_35–C	-0.001347
_36–C	-0.000578
_37–C	-0.003799
_38–C	-0.005215
_4–C	0.001588
_5–C	-0.000612
_6–C	-0.005330
_7–C	-0.000390
_8–C	-0.009665
_9–C	-0.006661

Weighted Statistics

R-squared	0.403214	Mean dependent var	-0.006064
Adjusted R-squared	0.347126	S.D. dependent var	0.043921
S.E. of regression	0.035488	Sum squared resid	1.005026
F-statistic	14.57199	Durbin-Watson stat	2.178377
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.442304	Mean dependent var	-0.005157
Adjusted R-squared	0.389888	S.D. dependent var	0.045434
S.E. of regression	0.035488	Sum squared resid	1.005026
Durbin-Watson stat	2.191680		

Industry Classification:

1. Agriculture; 2 Forestry and fishery; 3. Coal mining, dressing and briquetting, oil and gas extraction; 4. Metal, uranium and thorium mining and dressing; 5. Mineral quarrying and mining; 6. Food, drink and tobacco products; 7. Textiles, textile articles and knitwear; 8. Clothes and allied articles; 9. Leather, fur and footwear industry; 10. Wood processing; 11. Cellulose, paper, printing and publishing industry; 12. Coke, refined petroleum products and nuclear fuel; 13. Chemicals, chemical products, synthetic and artificial fibers; 14. Rubber and plastics; 15. Nonmetal mineral feedstocks; 16. Metallurgy; 17. Metal casting, metal processing, manufacture of machines and equipment; 18. Electrical machinery and equipment, precision instruments and apparatus; 19. Transportation equipment; 20. Other industries; 21. Electricity, gas and water supply; 22. Construction; 23. Trade and repair of motor vehicles and household equipment; 24. Hotels and restaurants; 25. Transportation and travel agencies; 26. Communications; 27. Finance, credit and insurance; 28. Real estate and renting services; 29. Research and development; 30. Business services; 31. Public administration, compulsory social security; 32. Education; 33. Health care; 34. Veterinary care; 35. Other services and NGO activities; 36. Utilities; 37. Culture; 38. Sport and recreation.

Table 3

Employment Distribution by Sector in the European Union and the USA

	1978	1998
EU		
Agriculture	11.8	5.1
Industry	38.8	30.4
Services	49.4	64.5
USA		
Agriculture	2.7	2.7
Industry	31.1	23.6
Services	65.2	73.7

Source: ECB Monthly Bulletin, May 2000.

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