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Abstract

In this paper, I consider two heterogeneous economies that engage in a currency union. The small economy adopts the currency of the large and is highly dependent on its wealthier partner for trade. The effects of a currency union, deficit financing and institutional restraints on inflation are analyzed in a dual economy with different wage-setting mechanisms. In the model, Northern Cyprus is the small economy and Turkey, being the only country that acknowledges it as an independent state is its larger partner. Features of the labour markets determine the wages. We make a conjecture that wage determination in Northern Cyprus (NC) is conducted with reference to centralized-bargaining and that decentralized bargaining sets the wages in Turkey (TR). Hence, the differences in wage-setting procedures cause a dual labour market. In order to incorporate monetary dependence into the analysis, we let the Turkish central bank to decide on the economic policy measures, in this case the inflation rate and unemployment. The institutional restraints such as economic sanctions increase the inflexibility in the NC and cause shocks to affect the economy more. In order to compensate for the losses that might be endured by the government in NC, TR finances the budget deficit of NC. Therefore, TR government needs to consider the burden of this financing issue.

1. Introduction

Small island states are known to be quite vulnerable to economic shocks and Northern Cyprus (NC) is no exemption. Small domestic market size, limited resource base, uncertainty of supply, high dependence on trade, dependence on external finance are among the main factors of this vulnerability (Armstrong and Read,1998; Witter et al., 2002). Armstrong and Read (1998) claim that trade dependence limits the policy alternatives for small state governments under flexible exchange rates and therefore, they prefer either to peg their currencies to a hard currency such as the US dollar or directly adopt it.

The costs incurred by adopting a hard currency is assumed to be relatively low compared to the costs of an independent currency apart from giving up the control

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over inflation and interest rates. Alesina and Barro (2002) claim that the 'adoption of the currency of a low-inflation anchor country buys credibility'. In fact, the ERM is usually evaluated as a way to export the monetary stability in Germany, the low-inflation member of the system (Svensson, 1993). Notwithstanding, adopting a currency whether in the form of currency or monetary union has its advantages in real terms as well. Read (2004) attributes the growth success of small states to "their very effective use of a restricted domestic policy portfolio" and relates this effectiveness to exogenously determined "major macroeconomic indicators such as monetary policy, inflation and the exchange rate."

However, these benefits arise under normal conditions, such as free trade, access to international financial markets etc. On the other hand, Northern Cyprus, acknowledged only by Turkey as an independent state, faces economic sanctions including trade embargo from the international community and has no access to international financial markets. Therefore, the government had to adopt the Turkish lira as domestic currency and the economy depends highly on Turkey for trade. Moreover, the international sanctions adopted restrict the external financing available to the NC government. Turkey (TR) gives loans and/or grants to NC to finance its balance of payments deficits and its government spending each year. Loans and grants from Turkey have financed a significant share of government expenditures of NC in the past. In the 1977-86 decade, these loans, granted each year, have never been lower than 30% of government spending and even reached to 64% in 1982. In the following 20 years until 2005, the share of government expenditures financed by Turkish grants remained within the band between 10-30 %.

This study analyses the effects of institutional factors, monetary union and of deficit financing in a dual economy with different wage-setting mechanisms on inflation in the context of NC. I consider two heterogeneous economies that engage in a currency union. The small economy adopts the currency of the large economy and it is highly dependent on its wealthier partner for trade. Features of the labour markets determine the wages. The difference in wage-setting procedures cause a dual labour market usually defined as 'the co-existence of high and low wage sectors' (Fields, 2007). In order to incorporate monetary dependence into the analysis, we let the Turkish central bank to decide on the economic policy measures, in this case the inflation rate and

unemployment. In order to compensate for the losses that might be endured by the government in NC, TR can finance the budget deficit of NC. Therefore, TR government needs to consider the burden of this financing issue.

The paper is designed in the following fashion: Section 2 briefly summarizes the relevant literature on wage-setting in monetary/currency union models. Section 3 describes the framework with reference to the NC case. The following section develops the model in two parts, small and large economy. Section 5 describes the solution process, reports the findings and evaluates the propositions. Consecutively, The chapter concludes with a summary.

2. Literature

The large literature on the interaction between monetary policy and wage setting can be examined in two main strands. The first strand that finds its most compelling works in Barro and Gordon (1983) and Cukierman and Lippi (1999) assume that unions are concerned about inflation and thus they internalize the adverse effects of inflation. In the second, on the other hand, union totally ignores the inflation in determining wages and the central bank responds to nominal wages. This literature is mainly associated with various studies of Soskice and Iversen.

The response of the central bank is restricted if the country is part of a monetary or currency union. In a monetary union, the common central bank is assumed to decide on the policy measures taking the whole economy into consideration. On the other hand, if there is asymmetric currency union then the country, which unilaterally adopts a currency, loses control over domestic prices.

In his seminal work on the theory of optimum currency area, Mundell (1961) emphasizes that inflation depends on the "willingness of central authorities to allow unemployment in deficit regions". Assuming a currency area with two regions, a shift of demand from one region to the other causes inflation in the expanding and unemployment in the contracting regions. If the central authority opts for price stability then unemployment is aggravated. In other words, under currency union it is not possible to solve both the unemployment and the inflation problem. Peters (1995) proposes three alternatives to restore labour market equilibrium in the contracting

region after the demand shock. First alternative is to decrease nominal wages. Second is to allow or motivate immigration to the expanding region and the third is to adopt a fiscal expansion in the contracting region.

In models that analyse the role of union behaviour on inflation and/or price stability, economists concentrate on two scenarios, i.e. unions internalize price changes or ignore inflation. Various papers consider both of the scenarios in examining the interaction of wage setting and monetary policy. The degree of centralization of unions is influential in determining the level of real wages (Calmfors and Driffill, 1988). Both a very high degree of centralization and of decentralization leads to relatively lower real wages whereas intermediate level of centralization such as unions organised at industry level cause wages to be higher. When centralization is high, unions taking the influence of nominal wage increases on prices internalize price changes and thus inflation. On the other hand, in case the unions are highly decentralized and small, they are indifferent to inflation and they cannot increase wages as much as to affect inflation.

Gylfason and Lindbeck (1994) consider the strategic behaviour of the union and the government in the case of monetary expansion and establish that the unions are better off accepting lower wages which mean lower inflation and unemployment if they care about inflation and that the unions are likely to increase wages if they do not take inflation into consideration.

It is not only the internalization of price changes by the unions that influence the wage setting behaviour but also the anticipation of government policies. Iversen (1998) claims that in the case that unions anticipate an accommodating monetary or fiscal policy after wage increases then both wages and prices are likely to rise. Therefore, accommodating and non-accommodating policies have different unemployment performances. In a centralized bargaining structure an accommodating policy causes the unemployment level to be low same as the case of non-accommodating policy with decentralized wage setting. In contrast, centralized wage setting with non-accommodating policy and decentralized wage determination with accommodating policy generates high unemployment levels. Iversen (1998) uses an *index of commodification* measuring the average unemployment compensation rates and public sector share in total employment as a proxy for the presence of 'public policies

that accommodate union objectives'. This index helps to establish a relationship between expansionary policies and centralization level of bargaining. Expansionary policies are expected to get support from unions in highly centralized systems whereas unions resist restrictive public employment policies, such as privatizations in those systems.

In the case that unions are inflation averse, Grüner and Hefeker (1999) claim that real wages and unemployment may or may not be affected from wage changes, depending on the monetary policy adopted by the authority. A partially accommodating monetary policy leads to increases in both real wages and unemployment with nominal wages. In the case of an asymmetric currency union, labour unions ignore the domestic inflation since they cannot influence it. In a common currency area, unions would not be as influential on the central bank as in nation states (Peters, 1995) even if they engaged in a strategic interaction as considered by Grüner and Hefeker (1999). Therefore, the participants of the monetary union should be prepared to adopt policies to motivate labour mobility or increase financial support in lagging regions to combat unemployment (Peters, 1995).

3. Framework

The wage determination in these two economies is taken as separate mechanisms. In fact, it is the monetary policy and the grants/loans provided by the developed part to the less developed that ties these two economies. In other words, this paper uses the definition of dual labour market to examine the wage differences between the developed and less developed economies of a currency union with a difference. The difference stems from two issues. Firstly, the dependence of the less developed economy in terms of foreign trade on the developed part means that the prices of imported goods to the less developed part are relatively higher than the developed economy. Second, the less developed economy has no say in the monetary policy measures taken and the monetary authority of the developed economy adjusts its policies taking only the developed part into consideration. In a way, the government of the less developed economy has only fiscal policy measures to control the economy.

High wages are usually attributed to the relatively advanced sector and low wages to the relatively backward sector by dual economy theorists. However, in this paper, the developed sector or, in fact, economy (Turkey) is assumed to have a highly competitive labour market where the wages are driven down to competitive levels, whereas the less developed economy (Northern Cyprus) has relatively higher wages due to centralized wage determination.

In their model Duarte and Wolman (2003) assume that the tradable good can only be consumed in conjunction with the non-tradable good. In other words, supply of tradable goods depends on distribution channels, infrastructure etc. This is quite a reasonable assumption provided that you ignore the services sector, i.e. education, health, etc, which actually the consumer can easily consume alone. Nevertheless, in other to emphasize the difference between tradable and non-tradable goods, I assume these goods are not substitutable, i.e. the elasticity of substitution is zero.

The features of Northern Cyprus determine the main modeling framework. Since NC has limited natural resources as many small island states, its output is mostly comprised of non-tradable goods. The economy exports some agricultural produce and is highly dependent on imports from Turkey. So we are actually looking at a case of two countries with perfect product and financial market integration.

Table1. Unemployment levels under monetary policy options

Policy Type	Bargaining System	
	Centralized	Decentralized
Accommodating	*Low*	*High*
Non-accommodating	*High*	*Low*

Note: Summarized from Iversen (1998)

Table 1, which summarizes Iversen's (1998) reasoning, gives us a good framework to explain the situation in NC. The dual economy setting we're analysing has two economies, i.e. large and small. In the smaller economy, bargaining system is centralized and in the larger economy it is decentralized. Under these systems, it is in the best interest of the larger economy to adopt a non-accommodating policy which means adopting strict monetary and fiscal policy measures that help control inflation. However, for the small economy, it is better off adopting an accommodating policy

with monetary and/or fiscal expansion. Since the smaller economy cannot affect the monetary policy, the only measure it has to turn the *poorest* outcome to *best* is to adopt an expansionary fiscal policy. Taking such a measure, will have a positive effect on employment but at the same time increase prices.

4. The Model

In order to analyze the impact of labour market rigidity on inflation in a currency union between a large and a small economy, this paper considers the outcome as a result of monetary authority targeting the inflation in only the large country. In either case, the large economy is assumed to have a decentralized wage setting mechanism that leads to a competitive wage, which is equal to the value of marginal product of labour. Additionally, the product market in the large country is competitive. In other words, the economy as a whole is a competitive economy. On the other hand, the small economy is not only small but also an island economy with limited resources in terms of inputs and finance. The labour market has a highly centralized wage setting structure. In contrast, the tradable goods market faces competition from abroad, i.e. large country. However, the public firm has monopoly power over the production and supply of the non-tradable good.

4.1. Small Economy

In the small economy considered, there is one typical household, a public and a private firm.

Consumption
The household consumes a tradable and a non-tradable good. A CES utility function represents the household's preferences:

$$u(x_{N,S}, x_{T,S}) = \left[a_S x_{N,S}^{\rho_{h,S}} + (1-a_S) x_{T,S}^{\rho_{h,S}} \right]^{1/\rho_{h,S}} \qquad 1 > \rho_{h,S}, a_S > 0 \qquad (1)$$

and is maximized subject to the budget constraint $y_S^D = p_{N,S} x_{N,S} + p_{T,S} x_{T,S}$, where y_S^D is the disposable income. Disposable income is defined as the income earned minus the tax paid by the consumer, $y_S^D = y_S - T_S$, where t_S is the tax rate. The tax revenue is $T_S = t_S y_S$.

The demands for each of these goods are found to be:

$$x_{N,S} = \frac{y_S^D}{p_{N,S}} \frac{1}{1+\left(\dfrac{1-a_S}{a_S}\right)^{\sigma_{h,S}}\left(\dfrac{p_{T,S}}{p_{N,S}}\right)^{1-\sigma_{h,S}}}, \quad x_{T,S} = \frac{y_S^D}{p_{T,S}} \frac{1}{1+\left(\dfrac{a_S}{1-a_S}\right)^{\sigma_{h,S}}\left(\dfrac{p_{T,S}}{p_{N,S}}\right)^{1-\sigma_{h,S}}} \quad (3)$$

where $\sigma_{h,S} = 1/(1-\rho_{h,S})$ is the elasticity of substitution.

Thus consumption of each commodity depends on income, the price of the commodity and the price of that commodity relative to that of the alternative. Note that the share of expenditure on each commodity depends on the relative commodity

prices, e.g. $\dfrac{p_{N,S}x_{N,S}}{y_S^D} = \left[1+\left(\dfrac{1-a_S}{a_S}\right)^{\sigma_{h,S}}\left(\dfrac{p_{T,S}}{p_{N,S}}\right)^{1-\sigma_{h,S}}\right]^{-1}$

and that the expenditure share changes negatively with the price of the good if the elasticity of substitution is greater than one, i.e. price elastic good and positively otherwise, i.e. price inelastic good.

The changes in demand for tradable and non-tradable goods are

$$\hat{x}_{T,S} = \hat{y}_S^D - \hat{p}_{T,S} - (1-\sigma_{h,S})\mu_{T,S}(\hat{p}_{N,S} - \hat{p}_{T,S})$$

$$\hat{x}_{N,S} = \hat{y}_S^D - \hat{p}_{N,S} - (1-\sigma_{h,S})\mu_{N,S}(\hat{p}_{T,S} - \hat{p}_{N,S}).$$

In these expressions $\hat{y}_S^D$ is the income effect, $\hat{p}_{N,S}, \hat{p}_{T,S}$ are the direct price effects and the last term is the substitution effect which depends on the elasticity of substitution between tradable and non-tradable goods and on the shares of these goods $(\mu_{N,S}, \mu_{T,S})$ in the budget. As the elasticity of substitution between tradable and non-tradable goods in consumption approaches zero, i.e. goods are complementary, the changes in demands become: $\hat{x}_{N,S} = \hat{y}_S^D - \hat{p}_{N,S} - \mu_{N,S}(\hat{p}_{T,S} - \hat{p}_{N,S})$ and $\hat{x}_{T,S} = \hat{y}_S^D - \hat{p}_{T,S} - \mu_{T,S}(\hat{p}_{N,S} - \hat{p}_{T,S})$. The change in disposable income, $\hat{y}_S^D = \hat{y}_S - \varphi_S \hat{t}_S$, depends on the change in earned income $\hat{y}_S = \iota(\hat{L}_{b,S} + \hat{w}_{b,S}) + (1-\iota)(\hat{L}_{c,S} + \hat{w}_{c,S})$, where ι is the share of unionised labour income in total income and on the change in tax rate $\hat{t}_S$ interacting with $\varphi_S = \dfrac{t_S}{1-t_S}$, i.e. the ratio of tax to disposable income.

Production

There are two firms in two sectors, tradable and non-tradable, each producing one good, i.e. tradable and non-tradable, respectively. Decreasing returns to scale is assumed in the production of both goods. This assumption is in-line with the features of a small island economy under resource constraints such as Northern Cyprus. This resource constraint means that the economy has to use more and more inputs to increase its production but these resources are scarce and cannot be obtained easily at low cost. Therefore, inputs other than intermediate good and labour are assumed to be fixed generating decreasing returns to scale.

The private firm, which produces the tradable good, maximizes profits, $\Pi_{T,S} = p_{T,S}q_{T,S} - w_{b,S}L_{T,S} - p_{N,S}N_{T,S}$ subject to a decreasing returns to scale production function, $q_{T,S} = \left[L_{T,S}^{\rho_{T,S}} + N_{T,S}^{\rho_{T,S}} \right]^{\epsilon/\rho_{T,S}}$, $\rho_{T,S}, \epsilon < 1$ where $L_{T,S}, N_{T,S}$ are the labour and non-tradable goods used in production of the tradable good by the private firm and $\rho_{T,S}$ is the substitution parameter $\sigma_{T,S} = 1/(1 - \rho_{T,S})$ is the elasticity of substitution between labour and non-tradable input, ϵ is the scale parameters. The input demands are functions of the prices of the output and inputs, $L_{T,S}\left(p_{T,S}, p_{N,S}, w_{b,S} \right)$ and $N_{T,S}\left(p_{T,S}, p_{N,S}, w_{b,S} \right)$.

The non-tradable good is produced by the public firm according to the decreasing returns to scale production function: $q_{N,S} = L_{N,S}^{\beta_{LN}} J_{N,S}^{\beta_{JN}}$, $\beta_{LN} + \beta_{JN} < 1$, where $L_{N,S}$ is the labour employed by the public firm and $J_{N,S}$ is the imported intermediate good used in production of the non-tradable good. The public firm determines the non-tradable output level which maximizes its profits, $\Pi_{N,S} = p_{N,S}q_{N,S} - w_{b,S}L_{N,S} - p_{J,S}J_{N,S}$. Here, $(p_{N,S}, p_{J,S}, w_{b,S})$ are the prices of the non-tradable good, of the imported intermediate good and the bargained wage rate, respectively. The input demands of the public firm and the profit are $L_{N,S}\left(p_{J,S}, p_{N,S}, w_{b,S} \right)$ and $J_{N,S}\left(p_{J,S}, p_{N,S}, w_{b,S} \right)$.

The changes in tradable and non-tradable outputs depend on changes in input usage, i.e. labour and intermediate good demands by the public firm and labour and non-tradable good input demands of the private firm, are: $\hat{q}_{N,S} = \beta_{LN}\hat{L}_{N,S} + \beta_{JN}\hat{J}_{N,S}$ and

$\hat{q}_{T,S} = \in [\xi \hat{L}_{T,S} + (1-\xi)\hat{N}_{T,S}]$, where $\xi = \dfrac{L_{T,S}^{\rho_{T,S}}}{L_{T,S}^{\rho_{T,S}} + N_{T,S}^{\rho_{T,S}}}$. The changes in labour demand

and non-tradable input demands are $\hat{L}_{T,S} = \upsilon_{T,S}\hat{p}_{T,S} + \upsilon_{N,S}\hat{p}_{N,S} + \hat{w}_{b,S}$ and

$\hat{N}_{T,S} = \upsilon_{T,S}\hat{p}_{T,S} + \hat{p}_{N,S} + \upsilon_{N,S}\hat{w}_{b,S}$, where $\upsilon_{T,S} = 1/1-\in$ and $\upsilon_{N,S} = \sigma_{T,S} - (1/1-\in)$

show the responsiveness of input demands to prices depend on the scale and

elasticity, $0 < \sigma_{T,S}, \in < 1$[1]. Note that

$$\upsilon_{N,S} = (1/1-\rho_{T,S}) - (1/1-\in) = \begin{cases} >0 & \rho_{T,S} > \in \\ =0 & if \ \ \rho_{T,S} = \in \\ <0 & \rho_{T,S} < \in \end{cases}.$$

On the other hand, the change in labour demand for the production of non-tradable

good's $\hat{L}_{N,S} = \eta_{N,S}\hat{p}_{N,S} - \eta_{LJ,S}\hat{p}_{J,S} - \eta_{LL,S}\hat{w}_{b,S}$ responsiveness to price changes depends

on $\eta_{N,S}, \eta_{LJ,S}$ and $\eta_{LL,S}$. The first two are the output and intermediate good price

elasticities and the latter is the wage elasticity of labour demand. Since

$\eta_{N,S} = \dfrac{1}{1-\beta_{LN} - \beta_{JN}} > 0$, $\eta_{LJ,S} = \dfrac{\beta_{JN}}{1-\beta_{LN} - \beta_{JN}} > 0$ and $\eta_{LL,S} = \dfrac{1-\beta_{JN}}{1-\beta_{LN} - \beta_{JN}} > 0$ then

we can conclude that the labour demand of the public firm changes negatively with

$p_{J,S}$ and $w_{b,S}$. Notice that the labour demand for tradable good responds to wage

changes as much as the change itself, whereas the labour demand for non-tradable

good is more responsive to wage changes, i.e. $\partial \hat{L}_{T,S} / \partial \hat{w}_{b,S} = 1$, but since $\eta_{LL,S} > 1$

and $\partial \hat{L}_{N,S} / \partial \hat{w}_{b,S} = -\eta_{LL,S}$ then $\partial \hat{L}_{N,S} / \partial \hat{w}_{b,S} < -1$. Similarly, the change in demand

for intermediate good J, $\hat{J}_{N,S} = \eta_{N,S}\hat{p}_{N,S} - \eta_{JJ,S}\hat{p}_{J,S} - \eta_{JL,S}\hat{w}_{b,S}$ depends on the changes

in the prices of the non-tradable good, of own price and the wage rate, where

$\eta_{JJ,S} = \dfrac{1-\beta_{LN}}{1-\beta_{LN} - \beta_{JN}} > 1$ and $\eta_{JL,S} = \dfrac{\beta_{LN}}{1-\beta_{LN} - \beta_{JN}} > 0$.

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[1] $\upsilon_{N,S} = \sigma_{T,S} - \upsilon_{T,S} < 0$, i.e. $\upsilon_{T,S} > \sigma_{T,S}$ so the responsiveness of labour and non-tradable input to changes in the price of the tradable good has to be less than the elasticity of substitution between inputs in the production of the tradable good.

Wage-Setting Mechanism

The labour force is divided as those that receive the bargained wage and that receive the competitive wage, $L_S = L_{b,S} + L_{c,S}$. Those working at the bargained wage can either be employed in the non-tradable sector and work for the public firm or in the tradable sector and work for the private firm, $L_{b,S} = L_{N,S} + L_{T,S}$. Therefore, the change in labour employed at the bargained wage is expressed as $\hat{L}_b = \alpha \hat{L}_{N,S} + (1-\alpha)\hat{L}_{T,S}$.

The nominal wage is determined according to the right-to-manage model in which the union sets the wage to maximize the Nash product $\left[U(w_{b,S}, w_{c,S}, L_{N,S}) \right]^{\lambda} \cdot \left[\Pi_{N,S}(p_{N,S}, p_{T,S}, w_{b,S}) \right]^{1-\lambda}$ and the public firm determines the employment level. Here, $\Pi_{N,S}(p_{N,S}, p_{T,S}, w_{b,S})$ is the profit of the public firm and $U_S = (w_{b,S} - w_{c,S}) \cdot L_{N,S}(p_{N,S}, p_{T,S}, w_{b,S})$ is the union's payoff in which $w_{c,S}$ indicates the outside option or the competitive wage. In other words, labour that is not employed at the bargained wage rate gets the competitive wage as income. λ shows the bargaining power of the union. Maximising the monotonic transformation of the Nash product gives the same wage rate, therefore the union determines the wage rate so as to $\underset{w_{b,S}}{\text{Max}}\, \Omega = \lambda \log U_S + (1-\lambda) \log \Pi_{N,S}$. The bargained wage rate is $w_{b,S} = \phi w_{c,S}$, where the mark-up set by the union on the competitive wage, ϕ, depends on the bargaining power and elasticity of substitution between inputs, $(L_{N,S}, J_{N,S})^2$. The change in bargained wage depends on the change in the mark-up and the competitive wage, $\hat{w}_{b,S} = \hat{\phi} + \hat{w}_{c,S}$. Since $\phi = \left[1 + \dfrac{\lambda(1 - \beta_{LN} - \beta_{JN})}{\beta_{LN}} \right]$ then, $\hat{\phi} = \Phi \hat{\lambda}$, where the share of bargaining power in the mark-up is $\Phi = \dfrac{\lambda(1 - \beta_{LN} - \beta_{JN})}{\beta_{LN} + \lambda(1 - \beta_{LN} - \beta_{JN})}$.

Labour Market

The government either employs those that cannot find jobs at either of the non-tradable or tradable sectors paying the competitive wage or pays an equal unemployment benefit. The overriding reason in this policy would be to decrease

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[2] Notice that if the production function of the public firm exibits constant returns to scale technology then the bargained wage will become equal to the competitive wage.

international labour mobility. In fact, labour mobility is a condition that would ease the strain on the government in case of shocks and soften the adjustment process in the absence of a monetary policy mechanism. However, it is quite reasonable to assume that the NC government would like to minimize emigration for political reasons. Therefore, if the government cannot employ those that are not employed at the bargained wage then it needs to pay an unemployment benefit that is at least equal to the opportunity cost of migration to the large country and taking up employment there. The immigrant can find a job that pays the going wage, i.e. the competitive wage, $w_{c,S}$.

Part of the labour employed at bargained wage works in the production of the tradable good and rest in the non-tradable sector, i.e. $L_b = L_{N,S} + L_{T,S}$. Since there is no change in labour force, an increase in the labour demands of either of the sectors decreases the number of workers earning competitive wage depending on the shares of non-tradable, tradable and the competitive wage employment in total labour force, $(\varsigma_{N,S}, \varsigma_{T,S}, \varsigma_{c,S})$.

Market Clearing

Similar to the labour market, the product markets are assumed to clear. The consumer does not differentiate between domestic or foreign tradable good. Therefore, if the demand for tradable good exceeds the supply of private firm then that good is imported. In the expressions, $IM_{T,S}$ denotes the quantity imported for final good consumption and $J_{N,S}$ is the quantity used as intermediate good by the public firm. As for the non-tradable good quantity, total demand of the consumer and the private firm which uses the non-tradable good as an input needs to be met by the public firm. The change equations are determined accordingly, where χ_T shows the share of total tradable good demand met from domestic production by the private firm and the rest come from imports. The change in the supply of non-tradable good depends on the shares of final and intermediate good demands in the total $(\chi_N, 1 - \chi_N)$, respectively, and on the changes in these demands.

Prices

The private firm faces competition from imports therefore assumed to be a price taker. Since there is currency union between trading partners, the domestic price of the tradable good is the import price (or the exogenous world market price, p_T^W) plus the transaction or transportation cost ($\tau_{T,S}$), which is a function of the public good production, $p_{T,S} = p_T^W + \tau_{T,S}$ with $\tau_{T,S} = \tau(q_{N,S})$ and $\tau'(q_{N,S}) < 0$ (such as $\tau(q_{N,S}) = 1/q_{N,S}$).[3] For the non-tradable good there is no world price, its price is determined endogenously in the economy. Domestic price of the tradable good changes with the changes in world price and transportation cost.

Government

Government expenditure comes from the transfer payments made to the unemployed, $G_S = w_{c,S} L_{c,S}$. Since the government needs to pay unemployment benefit, these transfer payments should be financed from the tax revenue and external borrowing. Thus, the government budget is balanced through external debt, i.e. $G_S = T_S + H$ where H is the amount of external finance obtained from the large country. Therefore, any change in government expenditure needs to be met by either a change in tax revenue or a change in external borrowing or both, $\hat{G}_S = (1 - g_S)\hat{T}_S + g_S \hat{H}$, where $g_S = \dfrac{H}{G_S}$ is the share of government expenditure financed through external borrowing/grants.

4.2. Large Economy

The large or developed economy is assumed to function under perfect competition. The tradable good is produced with a decreasing returns to scale technology using labour, $q_{Ts,L} = L_{c,L}^\alpha$ where $1 > \alpha > 0$ and so the rate of change in the quantity supplied is a function of the price elasticity of supply, $e_{Ts,L} = \alpha/(1-\alpha)$, the change in

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[3] The transaction cost can also be thought as an ad valorem tariff or tariff equivalent of quota imposed by the government to protect the import-competing sector. In that case, the private firm gets $p_{T,S} = p_T^w(1 + \tau)$ as the price, where $0 < \tau < 1$ is the tariff rate.

competitive wage and in the producer's price, $p_{Tp,L}$. The market demand for tradable

good is $q_{Td,L} = q_d(p_{Tc,L})$ where $p_{Tc,L}$ is the consumer's price of the tradable good in

the large country[4]. It is possible to write the rates of change in demand and price using

the price elasticity of demand, $e_{Td,L}$. The labour market in this economy is also

competitive, in other words the competitive wage is equal to the value of the marginal

product of labour, i.e. $w_c = VMPL = \alpha L_{c,L}^{\alpha-1} p_{Tp,L}$ and thus $\hat{q}_{Ts,L} + \hat{p}_{Tp,L} = \hat{w}_c + \hat{L}_{c,L}$.

The government needs to finance its budget through taxation. Assume that prior to the

grant/loan to the small economy the government budget in the large economy is

balanced. In that case, the tax revenue collected is used to finance the small economy,

i.e. $H = t_L q_{Td,L}$. The government levies a tax then the price paid by the consumers

become $p_{Tc,L} = p_{Tp,L}(1 + t_L)$, where t_L is the indirect tax rate levied on consumers.

Hence, the inflation rate measured as the percentage change in consumers' price

depends on the change in producers' price and the change in the tax rate

$\hat{p}_{Tc,L} = \hat{p}_{Tp,L} + f\hat{t}_L$. Notice that f indicates the share of tax in price.

The large country exports the tradable good to the small country, which then uses

some as intermediate good and some as final good. Therefore, the total supply is

actually distributed between the domestic market and the external market:

$q_{Ts,L} = q_{Td,L} + X$. Hence the change equation becomes: $\hat{q}_{Ts,L} = \gamma \hat{q}_{Td,L} + (1-\gamma)\hat{X}_{T,L}$

where γ shows the shares of domestic demand in total output.

5. System of Equations and Solution

The model developed in this study can be used to examine the impact of shocks on

the rates of change in various aggregates. Therefore, the change equations are used

and the system of equations solved is given in Table 2. In the solution process, the

two economies are evaluated separately. Some variables endogenous to one economy

are taken to be exogenous for the other. However, this intertwined structure causes

complexity. Although a symbolic solution is possible for the large economy, solving

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[4] If there is no tax then the price consumers pay and the price producers receive are the same,

$p_{Tc}^L = p_{Tp}^L$.

the system of equations for the small economy requires a number of parameters to be pre-determined.

For the large economy, the impact of changes in exogenous variables, namely the labour employed, the exports to the small economy, the external lending/aid to the small economy, on demand and supply of the tradable good, the producer's and consumer's price and the competitive wage can be seen from Table 3 below.

Table 2. The system of equations used to solve the model[5].

SMALL ECONOMY

$\text{S1.} \hat{x}_{N,S} = \hat{y}_S^D - \hat{p}_{N,S} - \mu_{N,S}(\hat{p}_{T,S} - \hat{p}_{N,S})$

$\text{S2.} \hat{x}_{T,S} = \hat{y}_S^D - \hat{p}_{T,S} - \mu_{T,S}(\hat{p}_{N,S} - \hat{p}_{T,S})$

$\text{S3.} \hat{y}_S^D = \hat{y}_S - \varphi_S \hat{t}_S$

S4.

$\hat{y}_S = \iota(\hat{L}_{b,S} + \hat{w}_{b,S}) + (1-\iota)(\hat{L}_{c,S} + \hat{w}_{c,S})$

$\text{S5.} \hat{q}_{N,S} = \beta_{LN}\hat{L}_{N,S} + \beta_{JN}\hat{J}_{N,S}$

$\text{S6.} \hat{q}_{T,S} = \in[\xi\hat{L}_{T,S} + (1-\xi)\hat{N}_{T,S}]$

$\text{S7.} \hat{L}_{T,S} = \upsilon_{T,S}\hat{p}_{T,S} + \upsilon_{N,S}\hat{p}_{N,S} + \hat{w}_{b,S}$

$\text{S8.} \hat{N}_{T,S} = \upsilon_{T,S}\hat{p}_{T,S} + \hat{p}_{N,S} + \upsilon_{N,S}\hat{w}_{b,S}$

$\text{S9.} \hat{w}_{b,S} = \hat{\phi} + \hat{w}_{c,S}$

$\text{S10.} \hat{L}_S = \varsigma_{N,S}\hat{L}_{N,S} + \varsigma_{T,S}\hat{L}_{T,S} + \varsigma_{c,S}\hat{L}_{c,S}$

$\text{S11.} \hat{x}_{T,S} = \chi_T\hat{q}_{T,S} + (1-\chi_T)I\hat{M}_{T,S}$

$\text{S12.} \hat{q}_{N,S} = \chi_N\hat{x}_{N,S} + (1-\chi_N)\hat{N}_{T,S}$

$\text{S13.} \hat{p}_{T,S} = \varpi\hat{p}_T^W + (1-\varpi)\hat{\tau}(q_{N,S})$

$\text{S14.} \hat{w}_{c,S} + \hat{L}_{c,S} = (1-g_S)(\hat{t}_S + \hat{y}_S) + g_S\hat{H}$

$\text{S15.} \hat{L}_{N,S} = \eta_{N,S}\hat{p}_{N,S} - \eta_{LJ,S}\hat{p}_{J,S} - \eta_{LL,S}\hat{w}_{b,S}$

$\text{S16.} \hat{J}_{N,S} = \eta_{N,S}\hat{p}_{N,S} - \eta_{JJ,S}\hat{p}_{J,S} - \eta_{JL,S}\hat{w}_{b,S}$

$\text{S17.} \hat{L}_b = \alpha\hat{L}_{N,S} + (1-\alpha)\hat{L}_{T,S}$

$\text{S18.} \hat{M} = oI\hat{M}_{T,S} + (1-o)J_{N,S}$

LARGE ECONOMY

$\text{L1.} \hat{q}_{Ts,L} = e_{Ts,L}(\hat{p}_{Tp,L} - \hat{w}_c)$

$\text{L2.} \hat{q}_{Td,L} = e_{Td,L}\hat{p}_{Tc,L}$

$\text{L3.} \hat{p}_{Tc,L} = \hat{p}_{Tp,L} + f\hat{t}_L$

$\text{L4.} \hat{H} = \hat{t}_L + \hat{q}_{Td,L}$

$\text{L5.} \hat{q}_{Ts,L} + \hat{p}_{Tp,L} = \hat{w}_c + \hat{L}_{c,L}$

$\text{L6.} \hat{q}_{Ts,L} = \gamma\hat{q}_{Td,L} + (1-\gamma)\hat{X}_{T,L}$

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[5] In the solution process the price of the imported intermediate good used in the production of the non-tradable good is taken to be equal to the world price.

Table 3. Impact of changes in L_c, $X_{T,L}$ and H on the large economy

Variables	$\dfrac{\partial}{\partial \hat{L}_c}$	$\dfrac{\partial}{\partial \hat{X}_{T,L}}$	$\dfrac{\partial}{\partial \hat{H}}$
Demand ($\hat{q}_{Td,L}$)	$\dfrac{e_s}{\gamma(1+e_s)}$	$1 - \dfrac{1}{\gamma}$	0
Supply ($\hat{q}_{Ts,L}$)	$\dfrac{e_s}{1+e_s}$	0	0
Producer's price ($\hat{p}_p$)	$\left(\dfrac{1+e_df}{e_d\gamma}\right)\left(\dfrac{e_s}{1+e_s}\right)$	$(\gamma-1)\left(\dfrac{1+e_df}{e_d\gamma}\right)$	$-f$
Consumer's price ($\hat{p}_c = \hat{p}_T^W$)	$\dfrac{1}{e_d\gamma}\left(\dfrac{e_s}{1+e_s}\right)$	$\dfrac{\gamma-1}{e_d}$	0
Competitive wage ($\hat{w}_c$)	$\dfrac{1}{1+e_s}\left[e_s\left(\dfrac{1+e_df}{e_d\gamma}\right)-1\right]$	$(\gamma-1)\left(\dfrac{1+e_df}{e_d\gamma}\right)$	$-f$

These expressions show that the impact of changes in exogenous variables depends on the price elasticities of demand and supply and on the indirect tax rate (or the share of producer's price in consumer's price). Since the large economy produces a tradable good, the price elasticity of demand for this good is assumed to be 'reasonably' elastic, $1 < |e_d| < 1/f$ [6]. Then the impact of changes in L_c, $X_{T,L}$ and H on the large economy can be summarized as in Table 4.

Table 4. Summary of signs

Variables	$\dfrac{\partial}{\partial \hat{L}_c}$	$\dfrac{\partial}{\partial \hat{X}_{T,L}}$	$\dfrac{\partial}{\partial \hat{H}}$
Demand ($\hat{q}_{Td,L}$)	+	-	0
Supply ($\hat{q}_{Ts,L}$)	+	0	0
Producer's price ($\hat{p}_p$)	-	+	-
Consumer's price ($\hat{p}_c = \hat{p}_T^W$)	-	+	0
Competitive wage ($\hat{w}_c$)	-	+	-

As mentioned above, the small economy part of the model is solved through simulation using a set of parameters quite similar to those of the Northern Cyprus [7] to calibrate the model. Although the results are sensitive to parameters in value they are not sensitive in terms of signs. In other words, the impact of a change in the bargaining power of the union on the price of the non-tradable good in terms of

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[6] In that case $1 + e_d f > 0$.

[7] Some of these parameters are calculated from official data and some are rough guesstimates.

direction is not sensitive to the parameter choice and therefore, the results are robust. Table 5 shows the values of parameters used in simulation and Table 6 summarizes the impact of changes in exogenous variables on the small economy.

Table 5. Calibration parameters

Parameters/ Values									
$\mu_{N,S}$	0.76681	$\eta_{N,S}$	3.33330	g_S	0.30000	$\varsigma_{N,S}$	0.20000	$\in$	0.70000
$\mu_{T,S}$	0.23330	$\eta_{LJ,S}$	1.00000	Φ	0.32773	$\varsigma_{T,S}$	0.70000	φ_S	0.25000
β_{LN}	0.40000	$\eta_{LL,S}$	2.33330	l	0.75000	$\varsigma_{c,S}$	0.10000	α	0.65000
β_{JN}	0.30000	$\eta_{JJ,S}$	2.00000	$\upsilon_{T,S}$	3.33330	χ_T	0.30000	o	0.40000
ξ	0.70000	$\eta_{JL,S}$	1.33330	$\upsilon_{N,S}$	-0.83330	χ_N	0.60000	ϖ	0.75000

Table 6. Impact of changes in λ, p_T^W and w_c on various variables of the small economy

Variables		$\dfrac{\partial}{\partial\hat{\lambda}}$	$\dfrac{\partial}{\partial\hat{p}_T^W}$	$\dfrac{\partial}{\partial\hat{w}_c}$	$\dfrac{\partial}{\partial\hat{M}}$
External Borrowing/Grant	$\hat{H}$	-	-	-	-
Imported Tradable Final Good	$I\hat{M}_{T,S}$	+	+	+	+
Imported Tradable Intermediate Good	$\hat{J}_{N,S}$	+	+	+	+
Labour Employed at Bargained Wage	$\hat{L}_{b,S}$	-	+	-	+
Labour Employed at Competitive Wage	$\hat{L}_{c,S}$	+	+	+	-
Labour Employed at Non-tradable Sector	$\hat{L}_{N,S}$	-	+	-	+
Labour Employed at Tradable Sector	$\hat{L}_{T,S}$	+	+	+	-
Non-tradable Intermediate Good	$\hat{N}_{T,S}$	-	+	-	-
Non-tradable Price	$\hat{p}_{N,S}$	+	+	+	+
Tradable Price	$\hat{p}_{T,S}$	-	+	-	-
Non-tradable Production	$\hat{q}_{N,S}$	+	+	+	+
Tradable Production	$\hat{q}_{T,S}$	+	+	+	-
Bargained Wage	$\hat{w}_{b,S}$	+	0	+	0
Non-tradable Consumption	$\hat{x}_{N,S}$	+	+	+	+
Tradable Consumption	$\hat{x}_{T,S}$	+	+	+	+
Income	$\hat{y}_S$	+	+	+	-
Disposable income	$\hat{y}_d$	+	+	+	+
Direct tax	$\hat{t}_S$	+	+	+	-

The imports (exports) by the small (large) economy are treated as exogenous for the large economy similar to the external borrowing (lending) by the small (large) economy. On the other hand, union's bargaining power, the world price of tradable good, the competitive wage are taken as given for the small economy. A change in the demand for exports from the large economy affects the consumer's (or world) price of the tradable good and the competitive wage which then affects many variables in the small economy. Therefore, the chain rule is used to show the direct and indirect effects of a change (a shock) on prices.

Using these findings and the chain rule as explained it is possible to derive some important propositions about the effects of various changes on the performance of the small economy. The first exhibits a condition that needs to be pertained for the union to be highly influential on the wage rate.

Proposition 1: The bargaining power of the union is more effective on the mark-up if the responsiveness of the intermediate good demand to wage rate is low (cross-price elasticity is between 0 and 1) and less effective when the cross-price elasticity is high.

> *Proof*:   Remember   that $w_{b,S} = w_{c,S}\left[1 + \dfrac{\lambda(1 - \beta_{LN} - \beta_{JN})}{\beta_{LN}}\right] = \phi w_{c,S}$,   i.e.   the
>
> bargained wage rate depends on   the bargaining power, λ and the term
>
> $\dfrac{(1 - \beta_{LN} - \beta_{JN})}{\beta_{LN}}$, which is the inverse of $\eta_{JL,S} = \dfrac{\beta_{LN}}{1 - \beta_{LN} - \beta_{JN}} > 0$. If the cross-
>
> price elasticity is low, $0 < \eta_{JL,s} < 1$, then the magnifying impact of bargaining
>
> power on the mark-up is $\dfrac{1}{\eta_{JL,S}} > 1$.   On the other hand, a high cross-price
>
> elasticity means a change in the wage rate increases the demand for the intermediate good, i.e. substitution of labour with intermediate good, and thus likely to decrease the mark-up union can bargain for.□

Institutional factors as well as the policy measures taken have significant effects on the performance of the small economy and vice versa. Combining the solution to the large and small economy parts of the model, it is now possible to look at the impact of institutional factors and policy changes. The large economy can seek to decrease unemployment or inflation. Impact of an increase in employment can be used to

understand the consequence of a policy measure to decrease unemployment on the small economy.

Proposition 2: A policy adopted to decrease unemployment (or increase employment) in the large economy, increases the external borrowing required by the small economy.

   Proof: From the large economy system of equations we know that change in employment affects consumer's price, producer's price and competitive wage inversely. The small economy simulation shows that $\frac{\partial \hat{H}}{\partial \hat{w}_c} < 0, \frac{\partial \hat{H}}{\partial \hat{p}_T^W} < 0$. It is the consumer's price that the small economy takes as the world price of the tradable good. Therefore, $\frac{d\hat{H}}{d\hat{L}_{c,L}} = \underbrace{\frac{\partial \hat{H}}{\partial \hat{w}_c}}_{-} \underbrace{\frac{\partial \hat{w}_c}{\partial \hat{L}_{c,L}}}_{-} + \underbrace{\frac{\partial \hat{H}}{\partial \hat{p}_T^W}}_{-} \underbrace{\frac{\partial \hat{p}_T^W}{\partial \hat{p}_{Tc,L}}}_{1} \underbrace{\frac{\partial \hat{p}_{Tc,L}}{\partial \hat{L}_{c,L}}}_{-} > 0 \cdot \square$

As the need for external resources of the small economy increases, the large economy ends up providing more loans/grants but that affects the institutional background in the small economy in return.

Proposition 3: As the ability of the small economy government to finance its deficit through external resources increases, the bargaining power of the union increases.

   Proof: As mentioned earlier, the government finances its spending through taxes and external borrowing. The change in government expenditure $\hat{G}_S = \hat{w}_{c,S} + \hat{L}_{c,S}$ and finances $\hat{G}_S = (1 - g_S)\hat{T}_S + g_S\hat{H}$ has to be equal[8]. Substituting in $\hat{T}_S = \hat{t}_S + \hat{y}_S$ and by setting expenditures equal to finances, the change in budget can be written as $\hat{w}_{c,S} + \hat{L}_{c,S} = (1 - g_S)(\hat{t}_S + \hat{y}_S) + g_S\hat{H}$. We get an expression that shows the relationship between government finances, expenditures and union's position: $\Phi\hat{\lambda} = (-1/\iota)\hat{t}_S - \hat{w}_{c,S} + \hat{L}_{c,S} + \hat{L}_{b,S} + [(1 - g_S)/\iota g_S](\hat{G}_S - \hat{H})$ using the changes in income, wage and employment. Since Φ and ι are both positive, for $\hat{G}_S > \hat{H}$[9],

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[8] Remember that $g_S = H/G_S$.

[9] Taking the second derivative shows that $\partial^2\hat{\lambda}/\partial g^2 = g(1 - g)/\iota(1 - g)^2[\hat{w}_c + \hat{L}_c - \hat{H}] < 0$. In other words, $\lambda(g)$ is a concave function.

i.e. the government covers part of the increase in its spending by increasing taxes, then $\partial \hat{\lambda} / \partial g_S > 0$. □

Consequently, the change in the institutional environment has recursive effects on economic variables, such as imports and prices.

Proposition 4: Increase in the bargaining power of the union increases the imports.

Proof: Since $\hat{M} = o\hat{IM} + (1-o)\hat{J}_{N,S}$ then $\dfrac{d\hat{M}}{d\hat{\lambda}} = \dfrac{\partial \hat{M}}{\partial \hat{IM}} \dfrac{\partial \hat{IM}}{\partial \hat{\lambda}} + \dfrac{\partial \hat{M}}{\partial \hat{J}_{N,S}} \dfrac{\partial \hat{J}_{N,S}}{\partial \hat{\lambda}}$. From the simulation we know that all the terms in that expression are positive, therefore, the expression is positive. □

Proposition 5: Increase in the bargaining power of the union increases the price of the non-tradable good.

Proof: From the simulation we know that $\dfrac{\partial \hat{p}_{N,S}}{\partial \hat{\lambda}} > 0$. □

The literature on union behaviour and inflation substantiates these propositions. Among the three alternatives that could be used to restore labour market equilibrium in the contracting region after a shock were decreasing wages, allowing or motivating emigration and fiscal expansion (Peters, 1995). The first two alternatives are out of question in the sense that decreasing wages would lead to the emigration and that is not preferable. Both the TR and NC governments want to keep the island populated for political reasons and this is why the fiscal expansion in the contracting region is financed by the expanding (large) economy. However, contrary to the claims of Calmfors and Driffill (1988), the results indicate that the unions can ignore the influence of nominal wage increases on prices even though centralization is high provided that supply of resources, i.e. finance, is relatively elastic. The finance provided by the large economy enables the union in the small economy to increase wages as suggested by Gylfason and Lindbeck (1994) depending on the 'anticipation of government policies' or the ability of the government to finance its deficit as mentioned by Iversen (1998).

Moreover, a policy to control inflation in the large economy has repercussions for the small economy. Table 7 can be used to show the consequences of such a policy. If the large economy adopts inflation targeting measures and wants to decrease price volatility or impose price stability then that decreases the competitive wage.

Table 7. Impact of the changes in consumer's price on the large economy

Variables	$\partial / \partial \hat{p}_c$
Demand ($\hat{q}_{Td,L}$)	-
Supply ($\hat{q}_{Ts,L}$)	-
Producer's price ($\hat{p}_p$)	+
Employment ($\hat{L}_{c,L}$)	-
Competitive wage ($\hat{w}_c$)	+

Proposition 6: Policy measures taken by the large economy government to ensure price stability, increases inflation in the small economy if the tradable sector in the country overweighs the non-tradable sector.

Proof: Inflation in the small economy can be calculated as the weighted sum of changes in prices of the tradable and the non-tradable goods, i.e. $\hat{P}_S = \Omega_N \hat{p}_{N,S} + \Omega_T \hat{p}_{T,S}$ where Ω_N, Ω_T are the weights of these two sectors in the economy. Therefore, the impact of a change in the world price of tradable good on the small economy inflation is determined by

$$\frac{d\hat{P}_S}{d\hat{p}_{Tc,L}} = \underbrace{\frac{\partial \hat{P}_S}{\partial \hat{p}_{N,S}}}_{+} \underbrace{\frac{\partial \hat{p}_{N,S}}{\partial \hat{w}_c}}_{+} \underbrace{\frac{\partial \hat{w}_c}{\partial \hat{p}_{Tc,L}}}_{+} + \underbrace{\frac{\partial \hat{P}_S}{\partial \hat{p}_{T,S}}}_{+} \underbrace{\frac{\partial \hat{p}_{T,S}}{\partial \hat{w}_c}}_{-} \underbrace{\frac{\partial \hat{w}_c}{\partial \hat{p}_{Tc,L}}}_{+} > 0$$ .This expression simplifies

down to $\frac{d\hat{P}_S}{d\hat{p}_{Tc,L}} = \left(\Omega_{N,S} \frac{\partial \hat{p}_{N,S}}{\partial \hat{w}_c} + \Omega_{T,S} \frac{\partial \hat{p}_{Tc,L}}{\partial \hat{w}_c} \right) \frac{\partial \hat{w}_c}{\partial \hat{p}_{Tc,L}} > 0$. In the simulations the

changes in prices of tradable and non-tradable goods are calculated to be roughly

equal, i.e. $\frac{\partial \hat{p}_{Tc,L}}{\partial \hat{w}_c} \approx \frac{\partial \hat{p}_{N,S}}{\partial \hat{w}_c}$. In that case the relative size of the weights becomes

significant. If $\Omega_{N,S} < \Omega_{T,S}$, as is the case of Northern Cyprus, then $\frac{d\hat{P}_S}{d\hat{p}_{Tc,L}} < 0$.

In other words, as $\hat{p}_{Tc,L}$ decreases the inflation in the small economy increases. □

6. Conclusion

The model developed in this paper examines the consequences of policy measures adopted by the large economy on the small in the presence of currency union and the implications of restrictive institutional environment for the case of Northern Cyprus. In the model, NC is taken as the small economy and Turkey as its larger partner. Institutional factors, such as the trade embargo enacted by the international community and the repudiation it faces, causes the small economy to become more dependent on the large in terms of its trade and foreign funding. Implicit in the model, it is assumed that Turkey needs to keep Northern Cyprus populated to ensure her security and achieve some of her objectives. Additionally, the institutional environment and the structure of the economy, restrain the flexibility of the economy and the adjustment to external shocks.

In this chapter, the consequences of policy change in the large economy on the small are examined. The policy measures considered affects the unemployment and inflation in the large economy. The direct effect of an unemployment decreasing policy in the large economy is in the direction of decreasing prices in the small. However, the indirect effects through institutional environment and through the borrowing requirement cause inflation. Similarly, stabilizing the prices in the large economy means inflation for its smaller partner.

References

Alesina, A. and R. J. Barro (2002) Currency unions, *Quarterly Journal of Economics*, 117: 409-436.

Armstrong, H. W. and R. Read (1998) Trade and growth in small states: The impact of global trade liberalization, *World Economy*, 21: 563-585.

Calmfors, L. (2001) Wages and wage-bargaining institutions in the EMU-A survey of the issues, *Empirica*, 28: 325-351.

Chipman, J. S. and J. C. Moore (1980) Compensating variation, consumer's surplus, and welfare, *American Economic Review*, 70:5, 933-949.

Driffill, J. and F. Van der Ploeg (1993) Monopoly unions and the liberalisation of international trade, *Economic Journal*, 103: 379-385.

Duarte, M. And A. L. Wolman (2003) Fiscal policy and regional inflation in a currency union, Federal Reserve Bank of Richmond Working Paper No. 03-11.

Fields, G. (2007) Dual economy, Cornell University IRL Working Papers, [31.07.2009], http://digitalcommons.ilr.cornell.edu/working papers/17.

Frankel, J. and A. Rose (2002) An estimate of the effect of common currency on trade and income, *Quarterly Journal of Economics*, 117: 437-466.

Glyfason, T. and A. Lindbeck (1994) The interaction of monetary policy and wages, *Public Choice*, 79: 33-46.

Gregoriadis, N., C. Semenescu and P. Villieu (2006) Monetary policy and inflation divergences in a heterogeneous monetary union, The 55th Annual Congress of the French Association of Economic Science 14-15, 2006, Paris.

Grüner, H. P. And C. Hefeker (1999) How will EMU affect inflation and unemployment in Europe?, *Scandinavian Journal of Economics*, 101: 33-47.

Holden, S. (2005) Monetary regimes and the co-ordination of wage setting, *European Economic Review,* 49: 833-843.

Huizinga, H. (1993) International market Integration and union-wage bargaining, *Scandinavian Journal of Economics*, 95: 249-255.

Iversen, T. (1998) Wage bargaining, hard money and economic performance: Theory and evidence for organized market economies, *British Journal of Political Science*, 28: 31-61.

Johansson, P. (1991) *An introduction to modern welfare economics*, Cambridge: Cambridge University Press.

Manning, A. (1987) An integration of trade union models in a sequential bargaining framework, *Economic Journal*, 97: 121-139.

Mundell, R. A. (1961) A theory of optimum currency areas, *American Economic Review*, 51: 657-665.

Peters, T. (1995) European Monetary Union and labour markets: What to expect?, *International Labour Review*, 134: 315-332.

Svensson, L. O. (1993) Fixed exchange rates as a means to price stability: What have we learned?, NBER Working Paper No.4504.

Vousden, N. (1990) *The economics of trade protection*, Cambridge: Cambridge University Press.

Willig, R. (1976) Consumer's surplus without apology, *American Economic Review*, 66:4, 598-597.

Witter, M., L. Briguglio, and A. Bhuglah (2002) *Measuring and managing the economic vulnerability of small island developing states*, New York: UNDP.