

# Capital accumulation, unemployment, and self-fulfilling failure of economic reform

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## Abstract

I consider fiscal reform and the consequences of expectations about reform cancellation. The reform implies reduced taxes and the laying off of employees in an inefficient public sector. If the resulting unemployment level declines sufficiently fast the reform is completed. On the other hand, if high unemployment levels prevails for too long the reform is cancelled. Cancellation affects the return on capital negatively. Hence, expectations about cancellation will depress capital accumulation and increase the level of unemployment. As a result multiple rational expectations equilibria may arise where expectations about cancellation prove self-fulfilling. The modelling framework is Leontief technology in combination with Ramsey optimization that exhibits simple and attractive algebra.

*Keywords:* *JEL(O11,E61) Economic reform, Self-fulfilling expectation*

## 1 Introduction

Why do some economic reform programmes succeed while others fail? This important question is, and has been, the subject for a wealth of research. The explanation is often found to be a combined result of the economic consistency of the programme, its distributional implications, and the political environment in which the programme is carried out. Rodrik (1996) summarizes important contributions and concludes that *Most economists have now come to the realization that good economic advice requires an understanding of the political economy of the situation.* (p.38).

The literature on the political economy of reform has a multitude of contributions; both empirical and theoretical. Notable contributions to the many case studies are Williamson (1994), Haggard and Webb (1994), and Hellman(1998). Among the theoretical contributions are for example Alesina and Drazen (1991), Dewatripont and Roland (1992 a,b), and Rodrik (1995). These works are all concerned with how the political system may or may not be conducive for the implementation of reform. At the focus

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of discussion is how a reform programme should be designed in order to get sufficient political support and avoid cancellation. An extension to these issues is how *expectations* about the completion/failure of reform may affect the programme's performance. Hence, is it possible that the mere expectation about failure leads to a dismal programme performance that in turn leads to programme cancellation? I.e. a self-fulfilling failure.

The possibility of multiple equilibria, in models of economic reform, is explored among others by Froot (1988), Rodrik (1991), van Wijnbergen (1992), Roland and Verdier (1994), and Buffie (1995). The present work share the spirit of these works, but it distinguishes itself in the combination of two important features: The main analytical feature is a standard Ramsey model augmented with minimum real wage and unemployment. The main conceptual feature is the focus on functional income distribution and unemployment as the cause of reform cancellation. Moreover, Leontief technology in combination with Ramsey optimization provides surprisingly simple and attractive algebra.

The argument goes as follows: Consider a fiscal reform where employees in an inefficient public sector are laid off and taxes are reduced. Assuming downward sticky wages, the reform immediately lowers labour demand leading to unemployment. At the same time return on private capital increases, inducing capital accumulation. Hence, labour demand recovers and employment increases over time. Some time after the reform implementation there is a referendum. If the level of unemployment is sufficiently low, continuation of reform is approved and the programme is completed as planned. If the level of unemployment is too high the resistance towards continued reform will cause cancellation. The reform policy is in that event replaced by a status quo policy. That is, unemployment is instantly removed by tax-financed re-employment by the government. Cancellation will, because of the tax increase, instantly lower the return on capital. Hence, expectations about cancellation will depress capital accumulation giving high unemployment at the time of the referendum. Expectations about cancellation can therefore prove self-fulfilling generating multiple rational expectations equilibria. For a given programme, both expectations about cancellation and completion can turn out to be *ex post* rational.

The present analysis uses a stylized model of economic reform to explore these possibilities. Failure of reform is shown to depend both on economic factors and on political conditions. Important determinants are for example: the timing of election, the political structure, and external financing. These findings are discussed in relation empirical studies of reform. The paper concludes by a discussion of possible extensions and modifications.

## 2 The Model

Consider a closed economy with two sectors and a fixed supply of labour. The workers, normalized in size to one, find employment in the private sector,  $L$ , in the public sector,  $G$ , or are unemployed,  $U$ .

$$1 = L + G + U \quad (1)$$

The public sector uses no capital and acts only as an unproductive employer. The private sector uses labour and capital,  $K$ , in a fixed proportion (by normalization set to one). Assuming cost minimization, production and employment is given by

$$\frac{1}{a}X = L = K \quad (2)$$

where  $1/a$  is the capital-output ratio.<sup>1</sup>

The government is assumed to run a balanced budget and finances its total expenditure, the wage bill, by a tax on production. With  $\tau$  being the tax rate, this fiscal condition implies

$$wG = \tau X \quad (3)$$

The net private income from the private sector is divided between labour, earning  $w$ , and capital, earning a rate of return  $r$ . Thus, the income distribution identity is

$$(1 - \tau)X = wL + rK \quad (4)$$

Note that both  $w$  and  $r$  are measured net of taxes. When adding private income from the private sector (4) with income from the government sector (3) it becomes clear that total private income is equal to total production  $X$ . Finally, the return to capital follows when combining (2) and (4)

$$r = a(1 - \tau) - w \quad (5)$$

The static model (1)-(5) determines  $X$ ,  $L$ ,  $U$ ,  $Y$ ,  $\tau$ , and  $r$  as functions of  $K$ ,  $w$ , and  $G$ . The dynamics of the economy depends on the capital accumulation. Supply of capital,  $K$ , is determined by the workers savings/investment decision. The workers are assumed to be Ramsey consumers owning all capital and

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<sup>1</sup>These exact assumptions regarding the production structure are not essential for the argument, but are made for analytical clarity. The essential features are: That the public sector is less productive than the private sector and that the public sector do not employ a substantial stock of capital that can be transferred to the private sector. Consequences of allowing for factor substitution are discussed in the appendix.

maximizing a CRRA utility function

$$U = \int_{t=0}^{\infty} \frac{C_t^{1-\frac{1}{\sigma}} - 1}{1 - \frac{1}{\sigma}} e^{-\theta t} dt$$

where  $C$  is consumption,  $\theta$  the rate of time preferences, and  $\sigma$  the intertemporal elasticity of substitution. Abstracting from depreciation and using (3)-(5), the budget constraint is

$$\dot{K} = wL + \underbrace{(a(1-\tau) - w)}_r K + wG - C \quad (6)$$

where the agents views  $wG$  and  $\tau$  as parametric. By using standard methods of dynamic optimization, maximizing (??) with respect to (6) and inserting from (5), the aggregate consumption path is

$$\frac{\frac{\partial(C)}{\partial t}}{C} = \frac{\dot{C}}{C} = \sigma [a(1-\tau) - w - \theta] \quad (7)$$

This concludes the dynamic specification of the model. The long term implications of economic reform is determined by the steady state which is defined by full employment and stable production,  $U = \dot{X} = \dot{C} = 0$ . From (1)-(3) and (7) it follows that in steady state

$$X = aL = aK = a(1 - G) \quad (8)$$

$$w = X - \theta K = (1 - G)(a - \theta) \quad (9)$$

$$\tau = \frac{wG}{X} = G(1 - \theta/a) \quad (10)$$

(8) follows from the production structure and the  $U = 0$  condition. From (7) it is clear that in steady state the return on capital must be equal to the rate of time preferences. Total compensation of capital owners is thus  $\theta K$ . This leaves  $X - \theta K$  as compensation for the labour.

The steady state implication of a reduction of public employment is increased private sector employment and increased production. This is the rationale for reform. In the short run, however, the situation may be different. If the wage is downward inflexible there will be unemployment during transition and the gains and pains from reform will be unequally shared, with the unemployed as the losers.

## 2.1 Transition dynamics

An unannounced reduction in  $G$  to zero immediately leads to a transitional drop in the demand for labour and increased return to capital. As the return to capital increases, capital accumulation starts and demand for labour will grow gradually over time. This process will continue until  $r = \theta$  and

the new steady state is reached. When wages are downward inflexible, there will be unemployment during transition and the return to capital will be lower than the market clearing rate. The mechanisms explaining a downward inflexible real wage can be many. It can be given by efficiency wage considerations, minimum wage laws, or by decentralized negotiations between employers and inside workers. Here I assume that the wage cannot drop below its pre reform level  $\omega$ . Formally the wage function when  $G = 0$  is

$$w = \begin{cases} (1 - \theta) & \text{when } U = 0 \\ \omega & \text{when } U > 0 \end{cases}$$

When  $U$  is zero the wage is determined by the steady state condition (9). During transition, when there is unemployment, the wage is kept at its minimum level  $\omega$  and the return to capital is  $a - \omega$  and from (7) the Ramsey rule yields

$$\frac{\dot{C}}{C} = \sigma (a - \omega - \theta) = \beta \quad (11)$$

The minimum wage  $\omega$  implies a constant  $\beta$ . A constant  $\beta$  implies exponential growth of consumption  $c$  until the new steady state is reached. From this point in time consumption and production will be constant and equal. Since consumption grows exponentially during transition the new steady state is reached in finite time. The capital accumulation follows from (6), which can be written as

$$\dot{K} = aK - C \quad (12)$$

(11) and (12) is a system of two linear differential equations in the two variables  $K$ , and  $C$  that are solved using standard methods. A complete characterization requires the addition of the starting condition  $K(0) = K_0$  and the steady state condition  $\dot{K}(T) = 0$ , where  $T$  is the time when the new steady state is reached. Solving yields

$$C = \frac{a(a - \beta) e^{\beta t + aT}}{ae^{aT} - \beta e^{\beta T}} K_0 \quad (13)$$

$$L = K = \frac{ae^{\beta t + aT} - \beta e^{\beta T + at}}{ae^{aT} - \beta e^{\beta T}} K_0 \quad (14)$$

$$a > \beta = \sigma (a - \omega - \theta)$$

where the parameter restrictions follows when assuming  $\sigma < 1$ , consistent with the bulk of estimates (Blanchard and Fischer 1989 p.44). In the new steady state after reform  $G = U = 0$ ,  $L = K = 1$  and  $X = a$ . The terminal condition for  $K$  combined with (14) implicitly determines the actual time of



party; rallying and other pressure from the public may force the government to adjust its policy; in a one party state, dissatisfaction with the economic performance can cause a shift of power from the reformists to the conservatives (see for example Bates and Collier 1995). For ease of exposition the present assumption is that the shift comes about as a result of a referendum where the two alternatives are continuation or cancellation of the reform. A policy shift like this will have important implications for the dynamics of the economy and expectations about policy changes may prove self-fulfilling.

### 3 The political economy of policy reform

Following Romer and Rosenthal (1979) the policy maker has control of the agenda and have the right to implement reforms. The policy makers's objective is assumed to be maximization of efficiency. In this simple model this is achieved by the laissez-faire policy:  $\tau = G = 0$ . Some time after the reform implementation, at  $t = E$ , there is a referendum deciding whether to continue or cancel the reform. Without cancellation the transition will follow the dynamics described above. If the referendum results in cancellation, the following status quo policy is implemented: Full employment is instantly realized by increased taxes and re-employment in the public sector. In addition the level of public employment is frozen. Hence cancellation implies  $U = 0$ ,  $\dot{G} = 0$ , and therefore  $r = \theta$  and  $\dot{K} = 0$ . The support for cancellation depends on the individual voters's net gain. A complete characterization of the individuals's net gains/losses is beyond the scope of the present work. The simplifying assumption is made that there is a critical employment level  $\underline{L}$  such that if unemployment is high ( $L < \underline{L}$ ) reform is cancelled, while if unemployment is low ( $L > \underline{L}$ ) reform is continued.<sup>3</sup> To summarize; the outcomes are the following:

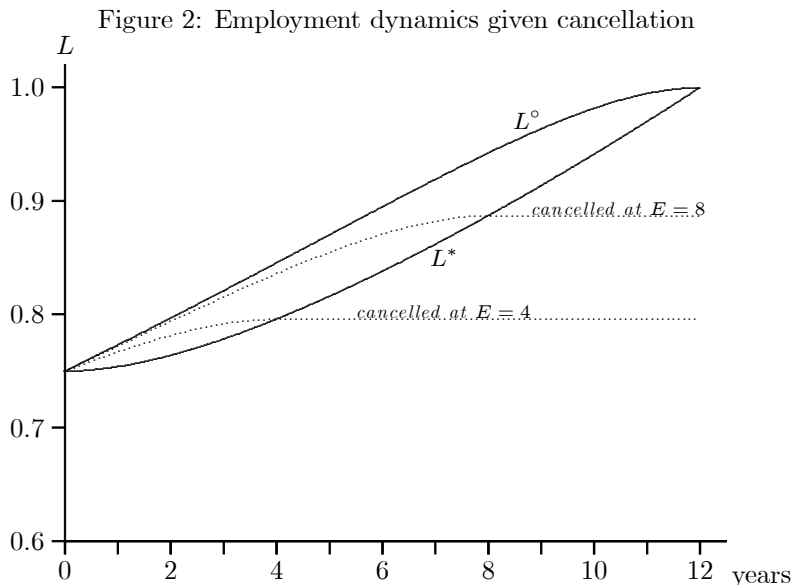
- $L > \underline{L}$  at the time of referendum, reform is approved and continued i.e.  $\tau = 0$  and  $r > \theta$
- $L < \underline{L}$  at the time of referendum, reform is cancelled and replaced by status quo policy i.e.  $\tau > 0$  and  $r = \theta$

Note that the assumption of a formal referendum is not essential for the analysis. The shift in political power resulting from a "referendum" may equally well be the result of popular pressure from the unemployed. In that case the time  $E$  may be interpreted for example as the time the opposition needs to organise or as capturing the patience of the unemployed: How long are they willing to wait before turning to riots et c.

History starts when the policy makers unexpectedly initiate a reform programme (for example following the break of the wall or a surprise agreement with the IMF). Hence, the laissez-faire policy

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<sup>3</sup>Individuals who are unemployed will tend to be in favour of cancellation as it implies an instant hiring. Wealthy individual will tend to gain from continued reform as it implies continuing receiving a high interest rate. These two factors will tend to reinforce each other, as those who are unemployed typically will be the ones with low or negative wealth. The reason is that the unemployed have to finance their consumption by reductions in wealth.



of  $\tau = 0$  is implemented over night. As already analysed, if the programme is not cancelled, capital accumulation and unemployment will follow paths as in Figure 1. Now, if a referendum at time  $t = E$  leads to cancellation the status quo policy is implemented, bringing the economy to a steady state, characterized by (8)-(10). This policy implies an increased tax rate, an equilibrium wage above the minimum, and removes the incentives for further investments. If a cancellation at  $t = E$  is expected the dynamics will be different from the undisturbed laissez-faire. Note first that  $E \geq \bar{T}$  implies that the referendum takes place *after* the transition is completed and has thus no effect. For expected cancellation at  $E < \bar{T}$  the employment path is found by setting  $T = E$  in (14) giving

$$L = K(t, E) = \frac{ae^{\beta t + aE} - \beta e^{\beta E + at}}{ae^{aE} - \beta e^{\beta E}} K_0 \quad (16)$$

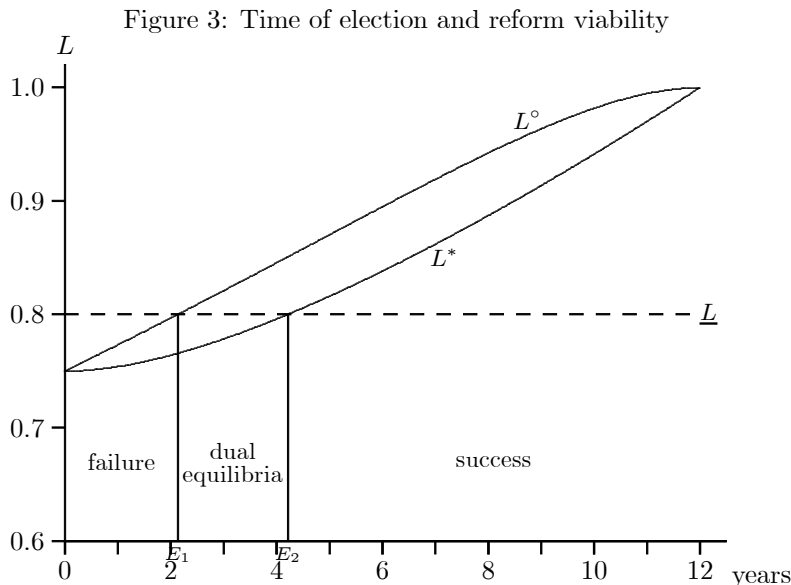
Two cases of cancellation ( $E = 4$  and  $E = 8$ ), are given by the dotted lines in Figure 2. The figure illustrates that employment growth (i.e. capital accumulation) will be weaker the earlier the cancellation. By differentiating (16) with respect to  $t$  and  $E$ , it is seen that this is a general result

$$\frac{\partial \dot{L}}{\partial E} = \frac{\partial^2 K(t, E)}{\partial t \partial E} = \frac{a\beta(a - \beta)(ae^{at} - \beta e^{\beta t})e^{(a+\beta)E}K_0}{(ae^{aE} - \beta e^{\beta E})^2} > 0$$

The essence of this result can be stated as follows:

- Capital accumulation and employment growth will be stronger the longer into the future the high return on capital is going to last.

This argument is condensed in Figure 2.  $L^o$  is the employment path for completed programme, given by  $L^o = K(t, \bar{T})$  while  $L^*$  illustrates employment at time  $T$  given cancellation at time  $T$  and follows



from (15). It is defined by the set of termination points for the employment paths with exogenous cancellation, as illustrated by the two dotted lines.

$L^*$  is derived under the assumption of *expected* cancellation at time  $t$ . *Actual* cancellation at time  $t$  will depend on two factors: First, there has to be a referendum at time  $t$  and second, the result of this referendum is cancellation. As discussed above, the outcome of the referendum depends on the unemployment level. Given the voting rule the reform is cancelled if  $L < \underline{L}$ , otherwise it's continued. The relationship between time of referendum, expectations, unemployment, and referendum outcome is illustrated in Figure 3. The critical employment level in this example is assumed to be  $\underline{L} = 0.8$ .<sup>4</sup>

Early in the transition process ( $t < E_1$ ) employment will be lower than  $\underline{L}$  irrespective of expectations. Both the employment path given expectations about continuation ( $L^\circ$ ) and given expectations about cancellation ( $L^*$ ) is below the critical level. If the referendum is held within this period (i.e.  $E \in [0, E_1]$ ) there will surely be voted in favour of cancellation. Hence, only expectations about cancellation can be rational; therefore cancellation is the only equilibrium outcome.

The opposite argument is valid late in the transition process. If the referendum is held late ( $t > E_2$ ) employment will be higher than  $\underline{L}$  irrespective of expectations. Therefore only expectations about completion can be rational and completion is the only equilibrium outcome.

In the intermediate interval expectations get more decisive: If the referendum is held in the interval  $E \in [E_1, E_2]$  and if cancellation is expected, capital accumulation will be low and employment will be too low for completion. If completion is expected, however, capital accumulation will be sufficiently high for completion. The outcome will be cancellation if cancellation is expected and completion if completion

<sup>4</sup>This implies a critical unemployment level of 0.2 which is in between Romer and Rosenthal's (1979) majority rule and Dewatripont and Roland (1992 b) unanimity rule.

is expected. Hence, there will be two rational expectations equilibria. Expectations about completion and cancellation will both prove ex post rational. A programme, which is perfectly credible given that it is perceived as credible, may turn out to be a failure, given expectations about failure. A failure in this case, can be characterized as a coordination failure. When everyone expects cancellation, it is not optimal for one single agent to act as if completion is the outcome. Completion would have been achieved, however, if all agents shared the expectation about completion. This outcome is a result of what Sen (1967) labels the ‘assurance problem’: *To get out of the problem all that is necessary is that each individual is assured that the others are doing the “right” thing, and then it is one’s own interest also to do the “right” thing.* (p. 122)

#### 4 Empirical relevance

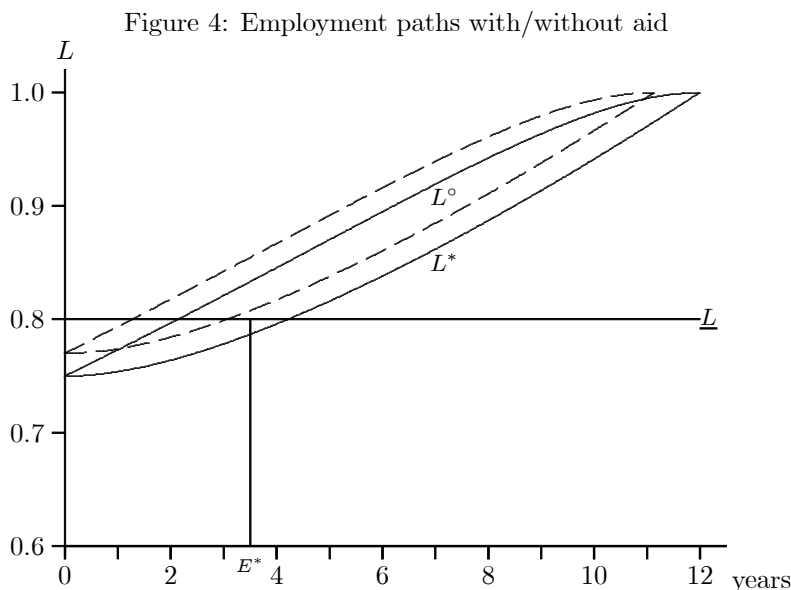
The linkage between uneven distribution, political instability and low investment has been documented for example by Alesina and Perotti (1996). They find that: “Inequality by fuelling social discontent, increases socio-political instability. The latter, by creating uncertainty in the politico-economic environment, reduces investment” (p.1203). In the present model the reduced investment in turn is what generates unemployment (i.e. inequality) and the vicious circle is established. Hellman (1998) studies in detail the experiences of Eastern European countries after the break of the wall.<sup>5</sup> He finds that six out of eleven reform countries have experienced electoral backlashes where reform governments have been replaced by parties advocating more moderate reforms. ‘However, these electoral reversals have not been accompanied by any major reversals in the course of economic reform in these countries.’ (p.215) Hence, for these countries an ex ante expectation of an electoral backlash due to popular pressure would have proven right. The consequences of such a backlash was, however, not as dramatic as expected. The model can be adjusted to capture such interruptions without altering the main results. First; the results go through even if the ‘reversal’ implies a delay in a gradual reform rather than a cancellation of a big bang reform. A delay also lowers the return on capital, at least for some time, below the original plan and expectations about a delay will lower capital accumulation. Second; it is the expectations about a policy change that is essential for the results. If the backlash, for some unpredicted reason, proves to be less conservative than expected that will be a pleasant surprise also for the capital owners.

Given the qualifications the analysis has several important implications. I will comment two predictions: First, success of reform is more likely the longer the time period between reform implementation and the “referendum”. Second, success of reform is more likely the smoother the transition process.

The first prediction is well in accordance with Williamson’s (1994) *honeymoon hypotheses* (“that

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<sup>5</sup>Thanks to a referee for pointing out this reference.



extensive reforms have to be implemented immediately after a government takes office” p. 25). A result that is also confirmed by World Bank (1998). Their analysis show that failed programmes are often explained by government crisis and that the probability of reform success is a declining function of the years in power. This result may be due both to the period of time before the next formal vote or because a new government gets some leverage in the form of patience among the unemployed.

The second prediction is related to the issue of external financing. In the case where external aid is used for financing physical investments it can be directly included in the model above. Being a closed economy model, external financing at the beginning of the reform enters as an exogenous supply of capital. I.e.  $K_0$  will increase while other parameters are unchanged. Consider a dual equilibrium case  $E^*$  in Figure 4. Foreign aid, increasing  $K_0$ , shifts the employment paths, both  $L^\circ$  and  $L^*$  up, easing transition. Thus, with aid<sup>6</sup> a referendum at time  $E^*$  results in a sure victory for the reformists. With aid, the economy will follow the  $L^\circ$  path, and in retrospect the foreign aid will appear superfluous. Without aid, however, the reform could have ended in a self-fulfilling failure. Sachs (1994) investigates the impact of external aid and finds it to be an important contributor to the success of reform. It helps “good governments to survive long enough to solve problems” (p. 512). This claim is met by a counter claim in Rodrik (1996): “The problem is that aid can also help bad governments survive.” (p. 31) and that aid equally well may lead to delayed reform. According to World Bank(1998) it all boils down to a question of “good” versus “bad” government. The present analysis provides one mechanism by which a “good” government is helped through the initial dangerous phase of transition. That the government in the present example is “good” is made implicit in the assumption that the aid money go where they are supposed to go.

<sup>6</sup>The dashed lines illustrates a 0.02 increase in  $K_0$ .

## 5 Conclusion and extensions

The analysis above has emphasized coordination failure as one possible reason for failure of economic reform. This is done in a growth model combined with an agenda-setting government framework. The main mechanism is straightforward: Cancellation affects the return on capital negatively and the earlier a cancellation of reform the weaker the capital accumulation.

The present context is a public sector downsizing and growth of the private sector. The analysis is, however, also relevant for other reforms implying changing relative prices, sectoral reallocation, and capital accumulation. The outward orientation of many developing countries is an obvious candidate.

The present analysis does not address the important subject of gradualism versus big bang (among the contributions to this debate are van Wijnbergen 1992 and Froot 1988) Is it possible for the reformists to avoid the pitfall of self-fulfilling failure by adopting a gradualist policy? I.e. a policy where  $\tau$  and  $G$  is reduced gradually over time as the private capital stock grows. The answer to this question is ‘yes’. Given that unemployment is what triggers cancellation a gradualist policy can steer clear of the critical unemployment levels. This possibility is explored in detail in Mehlum (1998b) in a discrete time version of the present model.

The political structure discussed is an agenda-setting government initiating reform that is subject to a vote at a later stage. These assumptions can be modified in several ways. One modification would be to let the status quo policy given cancellation be more conservative, reversing the policy entirely. As a result private sector would be forced to build down its capital stock after cancellation. This would increase the reluctance to invest when cancellation is expected. This effect would be even stronger in the case of irreversible investments. This highly relevant possibility is analysed in Rodrik (1991).

The main finding of the analysis above is that political economy and expectations matter a great deal for the transition process. A reform that is expected to be cancelled may be cancelled simply because of pessimistic (and ex post rational) expectations. This lesson is illustrated using a simple model. The model may be made much more complex and modified in several ways.<sup>7</sup> However, as long as individuals’s interests are divergent and the political system to some extent is rigid dual equilibria may arise.

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<sup>7</sup>Consequences of allowing for factor substitution are discussed in the appendix.

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## A Substitution in production

Allowing for factor substitution in the production function will modify the results. Consider the general constant returns to scale neoclassical production function, with standard properties.

$$X = F(K, L) = Lf(k), k = \frac{K}{L} \quad (17)$$

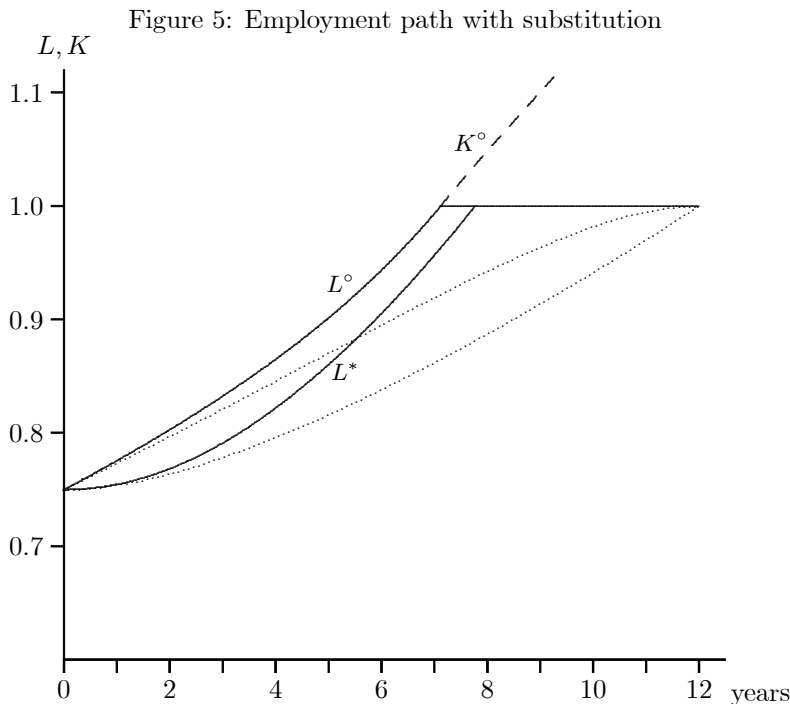
$$r = f'(k), w = f(k) - rk \quad (18)$$

Substitution makes it possible to increase employment (i.e. lower  $k$ ) without the wage going to zero. Hence, with substitution, if the minimum wage is sufficiently low, all fired government workers will instantly find employment in the private sector and the problems of unemployment are avoided altogether. In that case  $L = 1$  and  $k = K$  throughout the transition process and the economy will evolve according to the standard Ramsey model with  $r$  and  $w$  determined by the marginal return to capital and labour.

If the wage is absolutely downward sticky, as in the above analysis, there will be unemployment during transition. The fixed minimum wage determines a constant capital labour ratio  $\bar{k}$ , a constant return to capital  $\bar{r}$

$$\omega = f(\bar{k}) - f'(\bar{k})\bar{k}, \quad \bar{r} = f'(\bar{k}), \quad L = K/\bar{k} \quad (19)$$

Labour will be fixed relative to the capital stock and the interest rate will remain constant as long as the minimum wage is binding. The uninterrupted Ramsey path therefore consist of two stages. As long



as  $L < 1$  and  $w = \omega$  production will behave as if it had the following fixed proportion technology

$$X = f(\bar{k}) L = \frac{f(\bar{k})}{\bar{k}} K \quad (20)$$

When the capital stock reaches  $\bar{k}$  at time  $\bar{T}$  unemployment will be zero and  $r$  and  $w$  will be determined endogenously. From this point the capital stock continues to grow until the steady state condition  $f'(K) = \theta$  is reached. That the capital stock continues to grow beyond time  $T$  implies that  $\dot{K}(T) > 0$ . This is in contrast to the Leontief case where  $\dot{K}(T) = 0$ . As illustrated in Figure 5 the consequence is that the capital accumulation will be faster throughout, making the  $L^\circ$  curve steeper.<sup>8</sup> At  $\bar{T} \approx 7$  full employment is reached and the employment path gets flat.  $K$  continues to grow, however, until  $f'(k) = \theta$ .

Cancellation implies setting  $r = \theta$ , increasing the wage, and thereby removing further scope for investment. In the Leontief case the increased wage had no effect on private employment. When there is substitution the wage increase following cancellation lowers private employment and lowers thus production. Hence, with substitution, cancellation implies an instant loss of efficiency.<sup>9</sup> Agents expecting cancellation and the subsequent income fall will respond by saving more than in the Leontief case. As

<sup>8</sup>The present illustration is based on a CES production function with elasticity of substitution equal to  $1/2$ ,  $\omega = 0.250$ ,  $\bar{k} = 1$ , and  $f(\bar{k}) = a = 0.383$ . Hence the present example only differs from the example in the main body of the paper with respect to the rate of substitution.

<sup>9</sup>Many thanks to a referee for clarifying this mechanism.

a result also the  $L^*$  curve gets steeper.

All in all it's clear that, as factor substitution is introduced, the region of unambiguous failure and self-fulfilling failure both shifts to the left, perhaps reducing the region of self-fulfilling prophecies. The  $L^*$  may even intersect the  $L^o$  curve for  $L < 1$ . In that case a region of self-defeating prophecies adds to the complexity of the model.