ISSN 0265-8003

DEMAND-DRIVEN FINANCIAL DEVELOPMENT

Gilles Saint-Paul

Discussion Paper No. 1160
April 1995

Centre for Economic Policy Research
25–28 Old Burlington Street
London W1X 1LB
Tel: (44 71) 734 9110

CEPR Discussion Paper No. 1160

April 1995

ABSTRACT

Demand-Driven Financial Development*

The historical record suggests that economic development is associated with the rise of the financial sector. This rise is often triggered by exogenous events such as large budget deficits generated by wars or the availability of large investment projects such as railroads. This paper discusses the role played by such demand factors in financial development and how they favour growth.

JEL Classification: O1
Keywords: financial markets, economic growth, deficits, privatization, saving, crowding-out

Gilles Saint-Paul
DELTA
48 Boulevard Jourdan
75014 Paris
FRANCE
Tel: (33 1) 4432 2136

*This paper is produced as part of a CEPR research programme on *Macroeconomics, Politics and Growth in Europe*, supported by a grant from the Commission of the European Communities under its Human Capital and Mobility Programme (no. ERBCHRXCT930234). It was prepared for the conference on 'Financial Development and Growth', Groningen, December 1994, and the 'Macroeconmics of Privatization' project workshop, Bologna, January 1995. I am grateful to the European Community for financial support under a PHARE–ACE grant. I thank Irena Grosfeld for helpful suggestions.

Submitted 8 March 1995

NON-TECHNICAL SUMMARY

That financial development is important for growth and capital accumulation is now well recognized. A better financial market makes the allocation of savings to investment more efficient and may increase savings if it is positively correlated with their returns. Empirical evidence on the impact of financial development on real activity is reasonably robust and convincing (Goldsmith (1969), McKinnon (1973), Fry (1988,1993), King and Levine (1993)).

This paper is interested in the following question: why is it that financial development can be high or low depending on which country or time period we consider, and what are the factors that trigger such financial development?

We start from the observation that there can be complementarities between financial development and real development, and that these complementarities may keep the economy at an equilibrium with both insufficient financial and real development. These externalities can come from increasing returns in financial technology, externalities of financial development on technological choice, or thin market externalities in security markets. If externalities are important, financial development can be thought of as the economy shifting from one equilibrium to another. Such a shift may be triggered by transitory exogenous factors which render financial instruments more valuable. Once these factors have disappeared, the financial sector remains.

The historical record seems to suggest that such transitory events play an important role in financial development. Hence the creation of the Bank of England and the subsequent British 'financial revolution' was triggered by the Treasury's needs to finance wars in the late seventeenth century. Financial development in France was achieved in the nineteenth century as industrial tycoons needed to develop banks in order to fund large infrastructure projects such as railroads. More recently, financial markets have developed in Eastern Europe because of the large volume of capital transactions required by massive privatization programmes.

In all three instances, financial development has been driven by 'demand', i.e. a need to bring together large amounts of savings. In this paper we discuss the role of demand factors in financial development using a simple macroeconomic model. We find that an increase in public debt temporarily crowds out physical investment but has long-run positive effects on growth, as long as the economy remains in a regime where the amount of savings available to the private sector is constrained by the level of financial

development. Similar results hold with large-scale privatization and large investment projects, although the latter have much lower crowding out effects in the short run. Furthermore, there may be multiple equilibria and a temporary increase in public borrowing may trigger a shift of the economy from an equilibrium with low financial development to an equilibrium with high financial development.

Demand-driven financial development*

Gilles Saint-Paul

Abstract

The historical record suggests that economic development is associated with the rise of the financial sector. This rise is often triggered by exogenous event such as large budget deficits generated by wars or the availability of large investment projects such as railroads. This paper discusses the role played by such demand factors in financial development and how they favor growth.

1 Introduction

That financial development is important for growth and capital accumulation is now well recognized. A better financial market makes the allocation of savings to investment more efficient and may increase savings if it is positively correlated with their returns. Empirical evidence on the impact of financial development on real activity is reasonably robust and convincing (Goldsmith (1969) McKinnon (1973), Fry (1988,1993), King and Levine (1993)).

This paper is interested in the following question: why is it that financial development can be high or low depending on which country or time period we look at, and what are the factors that trigger such financial development ?

We start from the observation that there can be complementarities between financial development and real development, and that these complementarities may keep the economy at an equilibrium with both insufficient financial and real development. These externalities can come from increasing returns in the financial technology, externalities of financial development on technological choice - these are discussed in Saint-Paul (1992a,b) -, or thin market externalities in

*This paper was prepared for the conference on financial development and growth, Groningen, december 1994, and the "Macroeconomics of Privatization" project workshop, Bologna, January 1995. I am grateful to the European Community for financial support under a PHARE-ACE grant. I thank Irena Grosfeld for helpful suggestions.

security markets (Pagano (1993)). If externalities are important, then financial development can be thought of as the economy shifting from one equilibrium to another. Such a shift may be triggered by transitory exogenous factors which render financial instruments more valuable. Once these factors have disappeared, the financial sector remains.

The historical record seems to suggest that such transitory events play an important role in financial development. Hence, the creation of the Bank of England and the subsequent British "financial revolution" was triggered by the Treasury's needs to finance wars in the late seventeenth century. Financial development in France was achieved in the nineteenth centuries as industrial tycoons needed to develop banks in order to fund large infrastructure projects such as railroads. More recently, financial markets have developed in Eastern Europe because of the large volume of capital transactions required by massive privatization programmes.

In all three instances, financial development is driven by "demand", i.e. a need to bring together large amounts of savings. In this paper we discuss the role of demand factors in financial development using a simple macroeconomic model.

The rest of the paper is organized as follows: section 2 describes the three experiences of financial development in England, France, and Eastern Europe. Section 3 develops a model which allows to analyze the role of these demand factors - particularly public debt - in providing financial infrastructure.

2 Strategies for financial development

2.1 The English model:The role of public debt

According to some economic historians (for example Dickson (1967), Kindleberger (1984)), the industrial revolution in England was preceded by a "financial revolution" which set up the structure of the English financial system for a long time.

The key event which triggered that financial revolution was the founding of the Bank of England in 1694. The Bank of England was founded in order to finance the large budget deficits that were generated by the Nine Year's war with France. Therefore, British public debt, while reducing the amount of saving available for productive capital accumulation,[1] had positive effects on the country's financial infrastructure. The founding of the Bank of England was followed by the development of private banks and capital markets. As North and Weingast (1989)

[1] That such crowding out was indeed prevalent at the time is the subject of considerable controversy among historians, for capital markets were much less integrated and developed than now. See Heim and Mirowski (1984), for example. In our model, that form of crowding out is somewhat ruled out by the assumption of a perfectly elastic supply for funds at a required rate of return equal to ρ.

report, the operations of the bank of England and trade in public debt generated positive externalities on the development of financial instruments for the funding of private investment. A stock market developed to trade the *Exchequer Bills*, the ancestors of treasury bills. In addition to the Bank of England,. Companies such as the South Sea Company or the East India company were actively engaged in the trading of government bonds, and were themselves joint stock companies whose shares were also traded on the stock market, thus increasing the depth of that market.. The private activities of the Bank of England included the discounting of private bills, which greatly contributed to the liquidity and credibility of the financial system, as well as drawing accounts.

Another important aspect of the English experience is that the founding of the Bank of England was reinforced by the enhanced credibility of government debt which was brought by the institutional changes which followed the "Great Revolution". According to North and Weingast, while the Crown had discretionary power over fiscal policy prior to the Revolution, after the Revolution the Parliament could tightly monitor the detail of government expenditure and even had a right of veto on them. This institutional change clearly embodied a commitment device to fiscal restraint when time is has come to repay the debt, since government finance is now controlled by the holders of the debt. As a result, despite the four-fold increase in government debt due to the war, interest rates actually fell.

The English experience is therefore suggestive that an increase in the government's borrowing requirement may exert positive spillovers on the country's financial infrastructure, provided the adequate level of credibility is embodied into the institutions.

2.2 French and German financial development in the nineteenth century

If we compare financial development in France with the British experience, we see that in France it lagged by at least one century: while financial intermediaries had always existed since the middle-ages to deal with government borrowing, the lack of credibility of this government and its reputation for capital levies and financial repression prevented government borrowing from playing a leading role in financial development - the British scenario. France had to wait until the Juillet Monarchy (1830-1848) and the Second Empire (1852-1870) to see business-friendly governments, as opposed to England who started having them after the Revolution (1689).

While the Bank of France was created by Napoleon in 1800 - more than a century after the Bank of England - it did not have the same impact as its English counterpart on French financial development. It suffered from the traditional lack of credibility of French national debt and consequently had difficulties selling its shares - contrary to the Bank of England which had been unexpectedly successful

in that respect. While merchant banking also existed prior to 1850, there was no marked improvements in the French financial sector until the Second Empire. One can however notice the creation of new financial intermediaries such as Laffitte's *Caisse Générale du Commerce et de l'Industrie* and Delessert's *Compagnie Royale d'Assurances Maritimes*. These intermediaries were set up with the purpose of financing large industrial projects and both Laffitte and Delessert were both bankers and industrial entrepreneurs.

The reign of Napoleon III saw the emergence of many big banks in France, some of them still in existence and playing a major role in French financial infrastructure. Interestingly, it was the existence of large investment projects - in particular the railways - which motivated the creation of many of these banks. This was made possible, in particular, by the existence of a close connections between bankers, high civil servants and industrial tycoons. Such close connections can still be observed in the culture of the modern French elites.

The clearest example of a financial intermediary mostly engaged in financing large investment projects was the *Crédit Mobilier* of the brothers Pereire, which was motivated by the financing of the railways in which it played a key role, under the protection of Napoleon III. According to Cameron (1967), the Crédit Mobilier was the "forerunner of the great 'mixed banks' that became characteristic of Continental Europe in the latter part of the nineteenth century". While the Crédit Mobilier eventually failed, it laid the model for many financial institutions across continental Europe.

One should also mention the *Crédit Foncier de France*, which helped to finance Paris's reconstruction (under the auspices of the famous Baron Haussman) and other public works, the *Crédit Industriel et Commercial*, the *Crédit Lyonnais* and the *Société Générale*. [2]

Large investment projects not only triggered the development of banking, but also of Stock markets. According to Cameron, banks were insufficient as providers of funds to the industry, and because of the large scale and lumpiness of the investments to be made, firms had a large interest in issuing shares. Securities market, however, were, as in England, complements rather than substitutes for banks. Consortium of banks were needed to underwrite the share issues of large infrastructure projects, and banks such as the Crédit Mobilier were acting as intermediaries between small shareholders and the firms to which it had lent money or that it controlled.

Investment projects played an even greater role in the development of the German financial infrastructure, of which banking is a major component. The *Darmstadter Bank*, for example, created during the 1850's, was modelled after the Crédit Mobilier, with which it was associated, and had the explicit goal of financing long-term investment (See Kemp (1978)). These banks not only played

[2] A description of the experience of French banks in the nineteenth century can be found in Born (1983).

a key role in the industrialization process, but also favored the development of further financial instruments such as stocks. As Kemp writes:

> Credit banks on similar principles were founded in (...) Germany during the following decade (...). These banks also undertook the usual banking services for customers and they were less interested in holding large stock of industrial shares than in encouraging the sale of such shares over their own counters. This was increasingly possible as railways were floated and industrial firms adopted the joint stock form of organization.
>
> German investment banking (...) provided an alternative model to that of Britain (...). It obviated the need for the slow build-up of capital by small firms, and, by making it possible to raise large amounts of capital, enabled big plants embodying the latest techniques to be established from the start.

We therefore conclude this section by noting that while public debt was favorable to financial development in England, it was harmful for it in France. What triggered financial development in France and the rest of continental Europe is the large needs for funds and intermediation services generated by large infrastructure projects in the nineteenth century.

2.3 Large scale privatisation and financial development in Eastern Europe

Eastern Europe entered its transition with both goods markets and financial markets to be developed. Interestingly, there was a strong complementarities between the two, as privatization was needed for creating goods markets, and financial markets were needed to enforce privatization. As a result, those countries such as Bulgaria, Romania, or, to a lesser extent, Poland, which had a slow or non-existing privatization programs also had an underdeveloped financial market, while more advanced countries such as the Czech Republic, Hungary and Russia had both greater financial development and a more successful privatization.

The parallel development of financial markets and privatization projects in the Czech republic is, in that respect, quite telling. This experience is described in detail in, for example, Mejstrik et al. (1994). Privatization favored the development of such financial intermediaries as the investment privatization funds (IPFs). These funds not only arose as a response to privatization, but actually played a key role in its success. In January 1993, the voucher program had been undersuscribed, as only 2 million Czechs had bought vouchers as compared to an expected 5 million. That figure was boosted to 8.5 million as a response to the advertising campaigns of the mutual funds. While these funds were making excessive promises, they played a key role in fostering the privatization program

because they offered the consumer an (hopefully optimally) diversified portfolio of shares in newly privatized firms. In the end, the investment funds collected 72 % of all vouchers in circulation. The episode illustrates how the timing of privatization is closely connected with the timing of financial development.

Another dimension of financial development in the Czech republic is the Prague Stock Exchange (PSE), which was opened in April 1993. This stock exchange started with nine securities, and turnover remained quite low up to October, when it exploded. The stock market grew rapidly because it was fueled by shares from privatized companies. The number of traded companies has now risen to over 1000. Another, parallel system of trading, the RM system, was created for small vouchers owners, with lower entry costs and a lower trading frequency (twice a month).

Although Mejstrik et al. write that

> Illiquidity continues to plague the capital market. Despite substantial capital flows from foreign investors, the market remains largely under-capitalized; the Czech population is simply unaccustomed to investing.

, it is clear that the privatization strategy has generated a large demand for financial services and therefore favored a level of financial development which is quite respectable by the standards of the region. As an element of comparison, the Warsaw stock exchange only has 28 shares being traded (see Nivet (1994)).

3 A Macroeconomic Model

Let us consider a simple model of endogenous growth and endogenous financial development where the latter is driven by the demand for loans.

3.1 Basic Equations

Time is continuous (as in the Blanchard (1985) overlapping generations model), and we assume savers have access to a storage technology which yields a constant exogenous return ρ. We assume the economy is constantly in a regime where only part of total savings is intermediated, so that the rate of return paid to intermediated savings must be equal to ρ.

There are two sectors: a production sector, which uses capital and labor, and a financial sector, which uses only labor. Labor is freely allocated across the two sectors. The government and the private sector have access to savings through financial intermediaries. The interest charged by financial intermediaries is, at any point in time t, $r_t > \rho$. The intermediation margin $r_t - \rho$ pays for the cost of financial intermediation.

The production sector has a constant returns technology with a Romer-type externality generating constant aggregate returns to capital:

$$Y_t = F(K_t, L_t, \overline{K}_t) \tag{1}$$

,where $\overline{K}_t = K_t$ describes the effect of the externality and the two following equations holds:

$$F(\lambda K_t, \lambda L_t, \overline{K}_t) = \lambda F(K_t, L_t, \overline{K}_t), \forall \lambda \geq 0 \tag{2}$$

$$F(\lambda K_t, L_t, \lambda \overline{K}_t) = \lambda F(K_t, L_t, \overline{K}_t), \forall \lambda \geq 0 \tag{3}$$

The latter equation implies, since $\overline{K}_t = K_t$, that the aggregate production function can be written as $F(K_t, L_t, \overline{K}_t) = K_t G(L_t)$.

Labor and capital are paid their private marginal product, which yields, using homogeneity:

$$w_t = \partial F / \partial L = K_t G'(L_t) \tag{4}$$

The depreciation rate of capital is δ. Accordingly, the first order condition for the marginal product of capital is:

$$r_t + \delta = \partial F / \partial K = G(L_t) - L G'(L_t) \tag{5}$$

We now turn to the financial sector. At each date t, the financial sector is described by its productivity B_t. B_t is the quantity of savings that can be processed by one unit of labor in the financial sector. Assuming perfect labor mobility between the financial and production sectors, the following arbitrage condition must hold:

$$w_t = B_t [r_t - \rho] \tag{6}$$

Condition (6) means that the revenue generated by one unit of labor in the financial sector, which is equal to the RHS, must be equal to the wage.

We normalize total labor force to 1. let z_t be employment in the financial sector. Then $L_t = 1 - z_t$. The total level of savings intermediated is equal to $S_t = B_t z_t$. This must be equal to the sum of gross investment and emissions of public debt:

$$B_t z_t = \dot{K}_t + \delta K_t + \dot{D}_t \tag{7}$$

, where D_t is the outstanding stock of public debt. Last, we assume that there is a learning-by-doing process in the financial sector: more financial activity today increases tomorrow's financial development:

$$\dot{B}_t = (a + b z_t) B_t \tag{8}$$

3.2 Short-run equilibrium

In the short run, interest rates, wages, and the allocation of labor are determined by equations (4),(5) and (6). Eliminating wages from the system, we see that equilibrium is determined by the following two equations:

$$B_t[r_t - \rho] = K_t G'(1 - z_t) \tag{9}$$

$$r_t + \delta = G(1 - z_t) - (1 - z_t)G'(1 - z_t) \tag{10}$$

Figure 3.1 shows how equilibrium is determined in the (z_t, r_t) plane. The downward sloping locus PP is given by equation (10). It tells us that when more people work in the financial sector, the marginal product of capital falls, due to the fact that the labor input in the production function is smaller. The FF locus (equation (9)), means that a higher interest rate drives up, through the intermediation margin, the wage in the financial sectors, which attracts labor in that sector.

As illustrated in figure 3.1, an increase in K_t/B_t generates an upward shift of FF and a fall in the equilibrium value of z_t. This is simply because it is associated with a rise in the productivity of labor in the productive sector relative to the financial sector.

Therefore, in the remainder of the analysis, we shall use a reduced form to describe the effect of K_t/B_t on z_t:

$$z_t = h(K_t/B_t) \tag{11}$$

3.3 Long-run Equilibrium Growth and convergence

We now turn to the determination of long-run growth. To do so, we make the following assumption on the management of public debt: we assume that the government maintains the ratio between public debt and the private capital stock equal to a constant d.

The two state variables governing the system are the capital stock K_t and the level of financial productivity B_t. Plugging (11) into (7) one may write:

$$\frac{\dot{K}_t}{K_t} = \frac{h(k_t)/k_t - \dot{d}_t - \delta}{1 + d_t} \tag{12}$$

,where $k_t = K_t/B_t$ and $d_t = D_t/K_t$. Similarly (8) can be rewritten:

$$\frac{\dot{B}_t}{B_t} = a + bh(k_t) \tag{13}$$

Subtracting (13) from (12) we can get an evolution equation for k_t :

$$\frac{\dot{k}_t}{k_t} = \frac{h(k_t)/k_t - \dot{d}_t - \delta}{1 + d_t} - (a + bh(k_t)) \tag{14}$$

Let us now consider what happens when d_t is set equal to a constant d. In principle, the RHS of (14) may change signs several times. That is, there can be multiple long-run steady states. The intuition for multiple equilibria is as follows: a reduction in k triggers labor reallocation toward the financial sector. If learning effects are very strong in the financial sector, such shift will further increase B relative to K, thus generating further reductions in k.

However, for a smooth enough specification of $h(.)$, this will not happen. Figure 3.2a shows the dynamics of k when h is isoelastic: $h(k) = Ak^{-\alpha}$. The economy then converges to a unique balanced growth path.

How is the growth rate determined in equilibrium ? K and B grow at the same rate g. Using (13) one can see that the growth rate satisfies $g = a + bh(k)$. *The growth rate is therefore a decreasing function of k, i.e.; an increasing function of z.* A higher proportion of the workforce must be employed in the financial sector to sustain a higher growth rate: the productivity of the financial sector, which is driven by learning-by-doing, must keep up with growth in the productive sector.

Higher government indebtedness has, in this model, a positive effect on long-run growth because it draws more labor into the financial sector. As illustrated in figure 3.2a, an increase in d shifts the $\dot{k}/k$ locus downwards around the equilibrium. Therefore, the equilibrium value of k falls: more people work in the financial sector, and growth is faster.

When multiple equilibria are present, as in 3.2b, an increase in public debt can have large impacts on growth and financial development by shifting the economy from a low-finance equilibrium to a high finance equilibrium. Furthermore, the economy may stay forever at the high equilibrium even when the rise in public debt is temporary.

Note that by assuming that not all desired savings are intermediated, we have ruled out any crowding-out effects of debt on physical capital accumulation in the long-run. Reintroducing these crowding-out effects would generate an ambiguous impact of d on g, since the crowding out effect would run counter to the financial effect.

3.4 Dynamics

Although there are no crowding-out effects in the long-run, in the short run increases in public debt are associated with a drop in capital accumulation. A permanent increase in the debt capital ratio therefore depresses and then increases capital.

To assess the magnitudes of these effects, we have run numerical simulations. We have used an isoelastic specification for h, $h(k) = Ak^{-\alpha}$. The typical response of the capital stock to a permanent increase in the debt/capital ratio is illustrated

in figure 3.3. This figure has been drawn for the following set of parameter values: $a = 0$, $b = 1$, $A = 10^{-5}$, $\alpha = 5$, $\delta = 0.1$. The economy starts in a steady state with a debt/capital ratio equal to $d = 1$, implying a growth rate of 3.2 % (and 3.2 % of the workforce in the financial sector). d then steadily rises to 2 in 2.5 years (Figure 3.4) and stays there thereafter. As shown in figure 3.3, the capital stock first falls and then rises, to overtake quickly its previous path. It eventually converges to a growth path at a rate of 4.3 % a year. Figures 3.5 and 3.6 show the response of the degree of financial development B_t and the share of financial employment z_t, respectively. z_t overshoots its long-run value since a lot of financial activity is needed, relative to the size of the economy, when d_t picks up.

The length of time after which the benefits of the increase ion public debt are felt depends on the elasticity of h. For $\alpha = 0.5$, the effect of doubling d on the rate of growth is very small (0.2 %), so that it takes several decades for k_t to overtake its previous path.

We also have simulated the impact of *temporary* increases in the debt/capital ratio. For a wide range of values of α, the long-run effect on the capital stock is strictly positive, more so when α is larger.

The model can be applied without modification to the case of large-scale privatisation, since a reduction in state-owned assets is equivalent to an increase in public debt.

3.5 Extension: the role of large investment projects

A very simple extension of the model can be made to capture the impact of large investment project on financial development - the "French model". For this, just assume that the net increment in the capital stock $\dot{K}_t$consists of a continuum of individual "projects", who yield the same rate of return (equal to the marginal product of capital r_t), but have different "sizes". Assume that the entrepreneurs who undertake these projects have a fixed amount $\bar{s}$ of personal savings. Let $\Phi(i)$ be the cumulative distribution of investment sizes i. The opportunity cost of undertaking the project if its size is less than $\bar{s}$ is equal to the return on the storage technology, ρ. Since in equilibrium one has $r_t > \rho$, entrepreneurs with project sizes less than $\bar{s}$ will not go to the financial market and undertake their project. Hence, a proportion $\phi = 1 - \Phi(\bar{s})$ of the projects will be intermediated. Therefore, the equilibrium condition (7) for financial intermediation can now be written, abstracting from public debt:

$$B_t z_t = \phi \dot{K}_t + \delta K_t \tag{15}$$

The accumulation equation for capital is now:

$$\frac{\dot{K}_t}{K_t} = \frac{h(k_t)/k_t - \delta}{\phi} \tag{16}$$

Finally, the evolution of k_t is now given by:

$$\frac{\dot{k}_t}{k_t} = \frac{h(k_t)/k_t - \delta}{\phi} - (a + bh(k_t)) \tag{17}$$

Comparing (17) with (14), we see that ϕ plays exactly the same role as d. An increase in the proportion of large scale project will thicken the upper tail of the distribution of i, thus increasing ϕ. This increases the demand for financial intermediation, thus drawing resources into the financial sector, which is beneficial for financial development and long-run growth.

As in the case of public debt, there is a crowding out effect, but it is both weaker and of a different nature. In the case of public debt, the crowding out effect comes from the fact that public debt increases the proportion of workers in the financial sector who process (unproductive) government bonds, thus reducing the amount of financial intermediation, given the size of the financial sector, available for processing transactions in productive assets. In the case of large projects, an increase in their share in total investment opportunities increases the demand for financial intermediation; to restore equilibrium, capital accumulation must fall, but it is now productive assets which crowd out each other, so that the short-run effect is much less damaging to growth.

Dynamic simulations confirm these views. Figure 3.7 shows the response of the capital stock to an increase in ϕ from 0.5 to 1. The parameters are the same as in the previous section, except for $A = 0.001$ and there is no government debt. The economy starts with a steady state with a growth rate of 5.7 %, and eventually reaches a steady state with a growth rate of 7.3 %. The transitional period where capital is below its pre-change trend is much shorter than in the previous exercise.

References

[1] Blanchard, Olivier (1985), "Debt, Deficits, and Finite Horizons", *Journal of Political Economy*

[2] Born, Karl Erich (1983), *International Banking in the 19th and 20th Centuries*, New York: St Martin's press

[3] Cameron, Rondo (1967), *Banking in the early Stages of Industrialization*, New York: Oxford U. Press,.

[4] Dickson, (1967), *The Financial Revolution in England*, Aldershot: Gregg Revivals

[5] Fry, Maxwell J. (1988), *Money, Interest and Banking in Economic Development*, Johns Hopkins U. Press

[6] Fry, Maxwell J. (1993), "Financial Repression and Economic Growth", University of Birmingham Working Paper.

[7] Goldsmith, Raymond W.(1969), *Financial Structure and Development*, Yale U. Press

[8] Heim, Carol and Philip Mirowski, (1987), "Interest rates and crowding out during Britain's Industrial Revolution" *Journal of Economic History*

[9] Kemp, Tom (1978) , *Historical Patterns of Industrialization*, Longman,

[10] Kindleberger, Charles P. (1984) *A Financial History Western Europe*, London: Allen and Unwin

[11] King, Robert and Ross Levine, (1993) "Finance and Growth: Schumpeter Might be Right", *Quarterly Journal of Economics*

[12] McKinnon, Ronald I. (1973), *Money and Capital in Economic Development*, Brookings.

[13] Mejstrik, Michal, Radek Lastovicka and Anton Marcincin, (1994) "privatization and opening the capital market in the Czech and Slovak republics", Mimeo, CERGE, Charles University, April 1994

[14] Nivet, Jean-François (1994), "The Warsaw Stock Market", Mimeo, DELTA

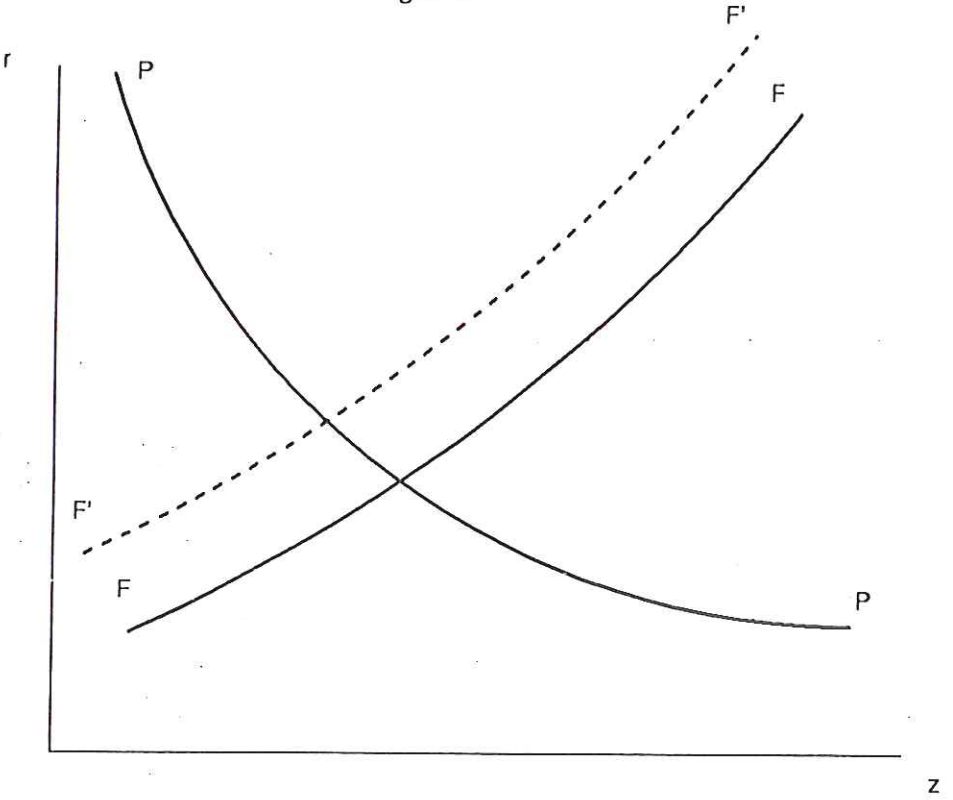
[15] North, Douglass and Barry Weingast, (1989), "Constitution and Commitment: The Evolution of Institutions Governing Public Choice in Seventeeth Century England", *Journal of Economic History*

[16] Pagano, Marco (1993), "The flotation of Companies on the Stock Market: A Coordination Failure Model", *European Economic Review*

[17] Saint-Paul, Gilles (1992a), "Technological Choice, Financial Markets, and Economic Development", *European Economic Review*

[18] Saint-Paul, Gilles (1992b), "Technological Dualism, Incomplete Financial Markets, and Economic Development", *Journal of International Trade and Economic Development.*

Figure 3.1



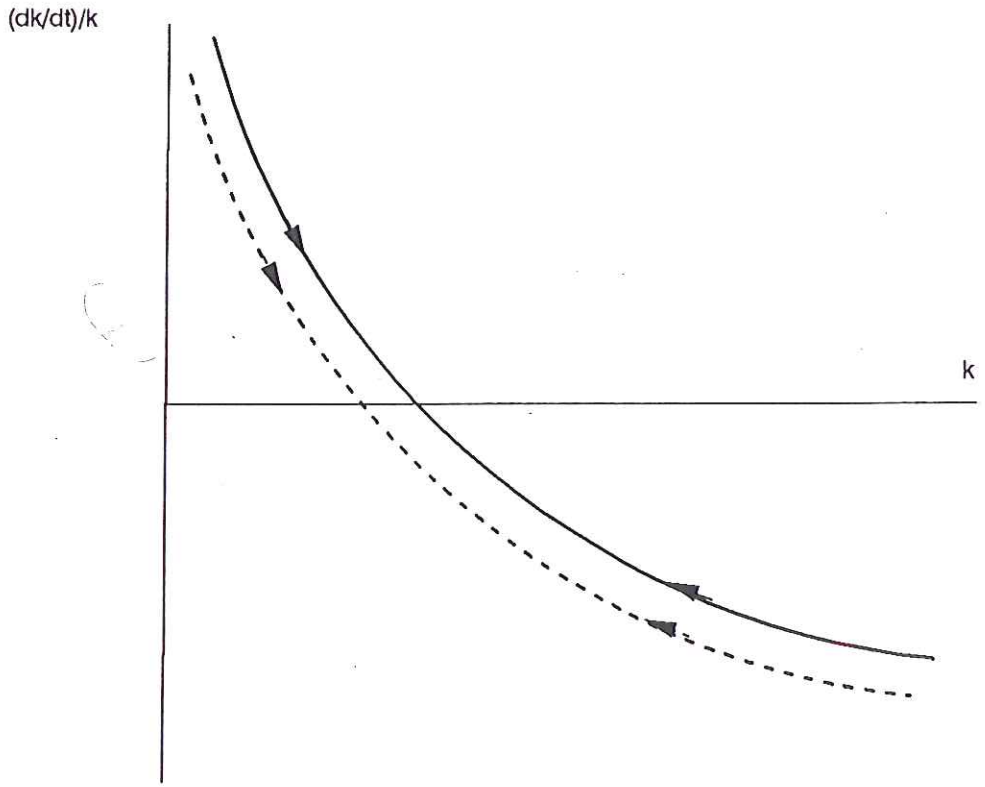
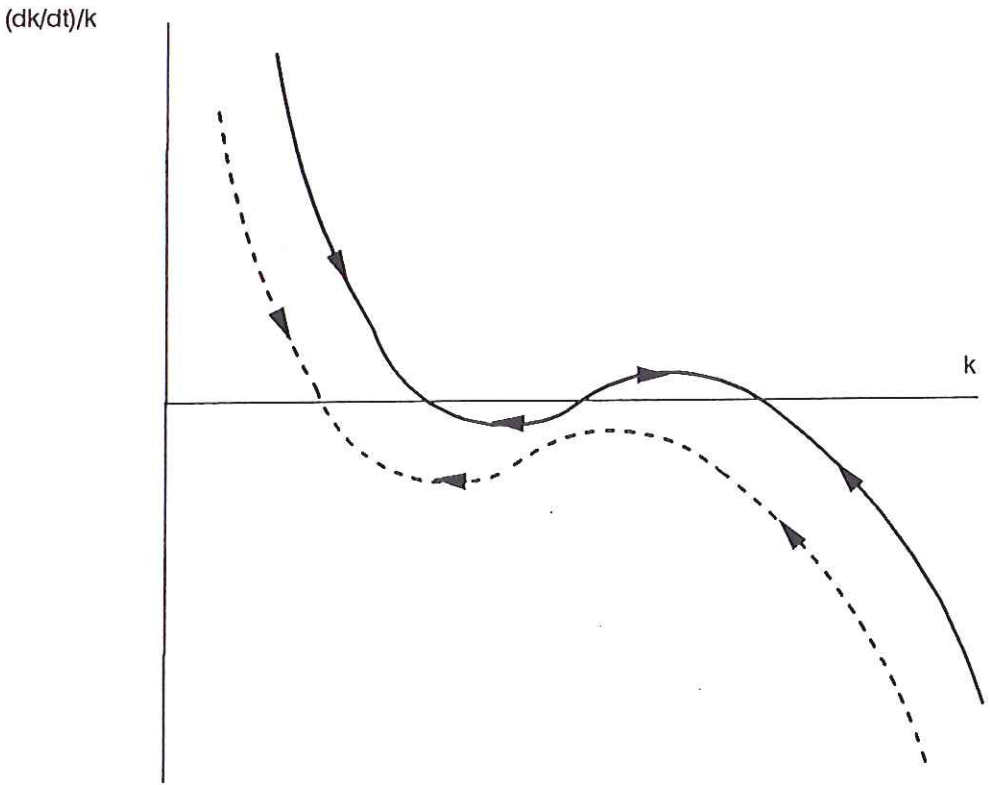
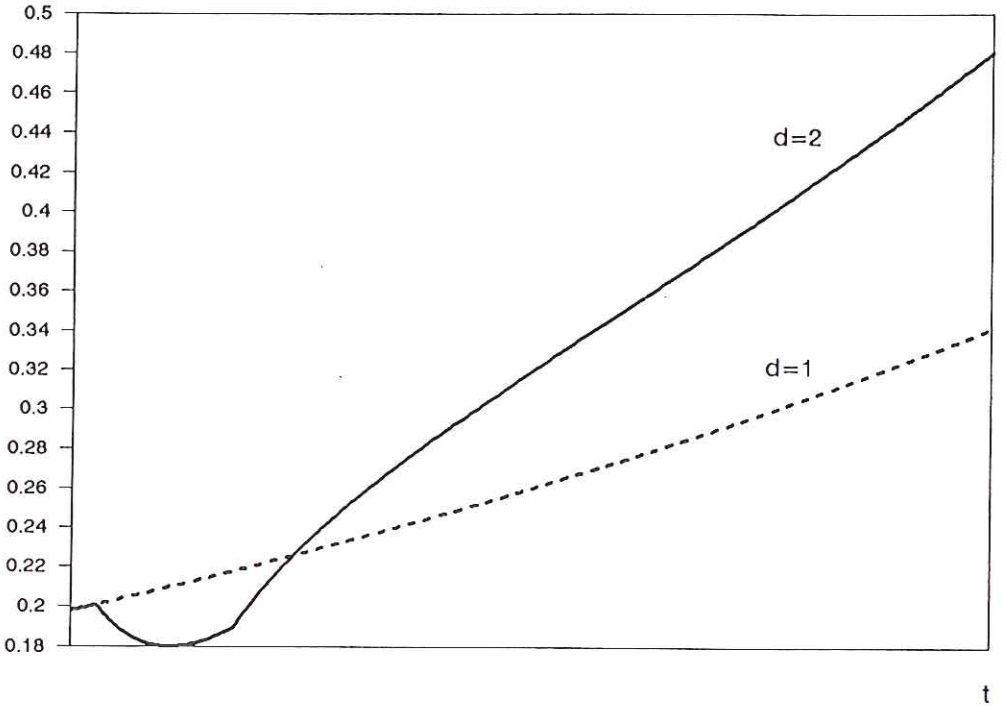

(dk/dt)/k
k

Figure 3.2b



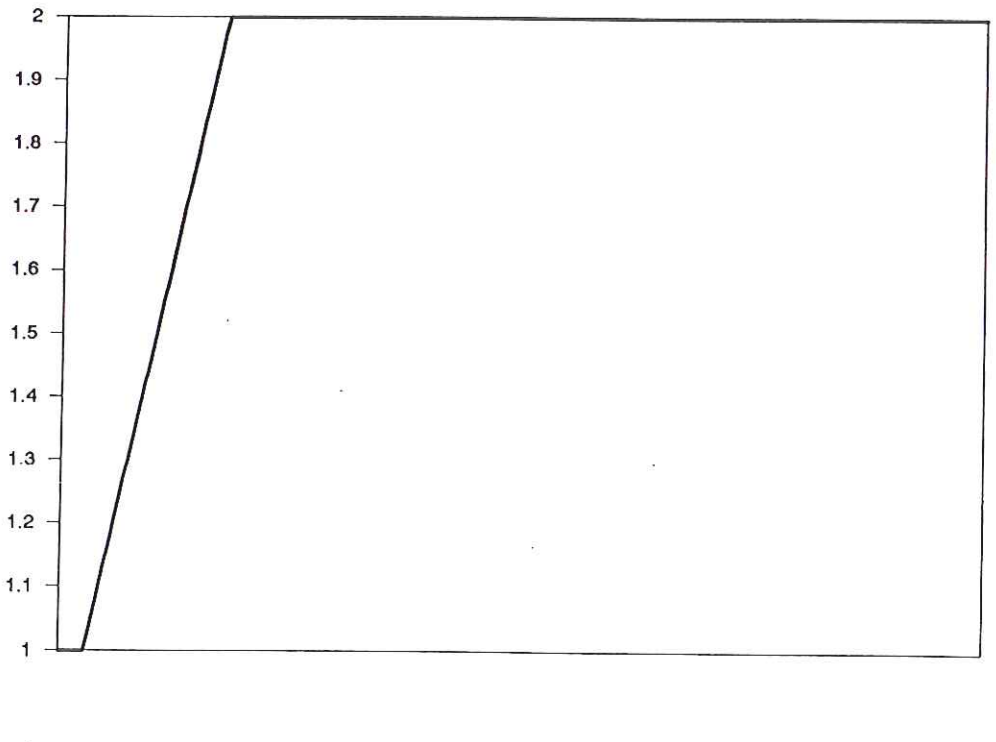
K

Figure 3.3


0.5
0.48
0.46
0.44
0.42
0.4
0.38
0.36
0.34
0.32
0.3
0.28
0.26
0.24
0.22
0.2
0.18
d=2
d=1
t

d

Figure 3.4



B

Figure 3.5

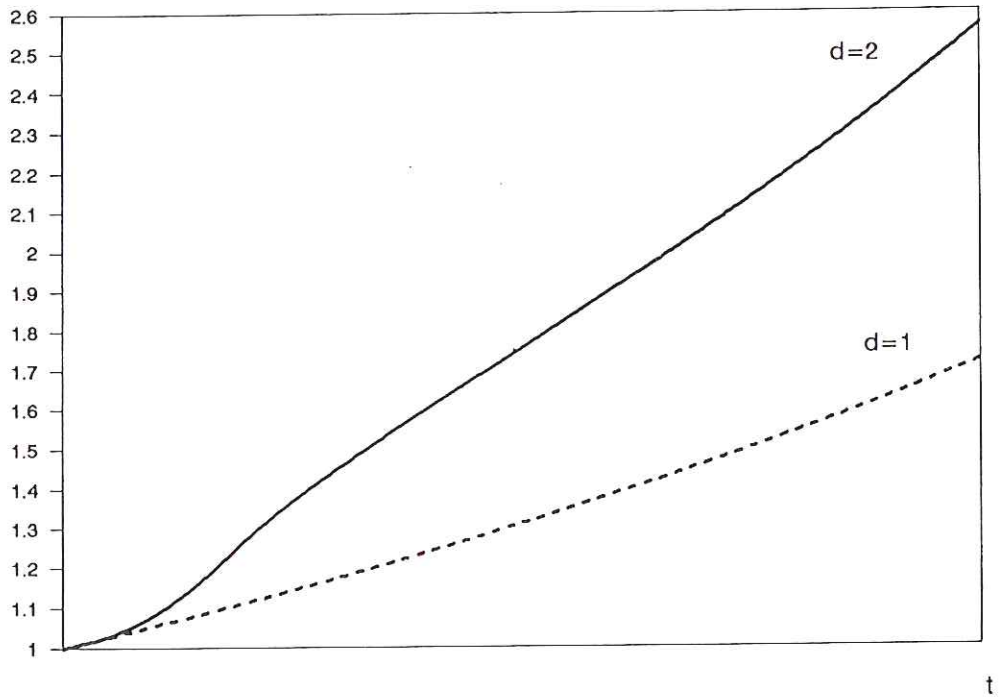
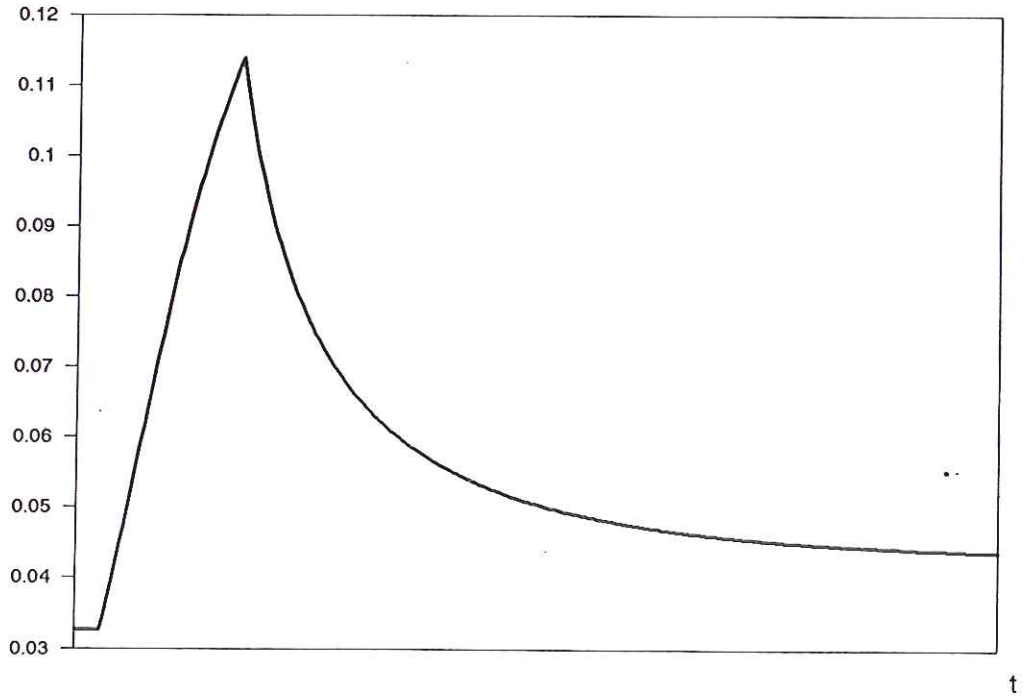
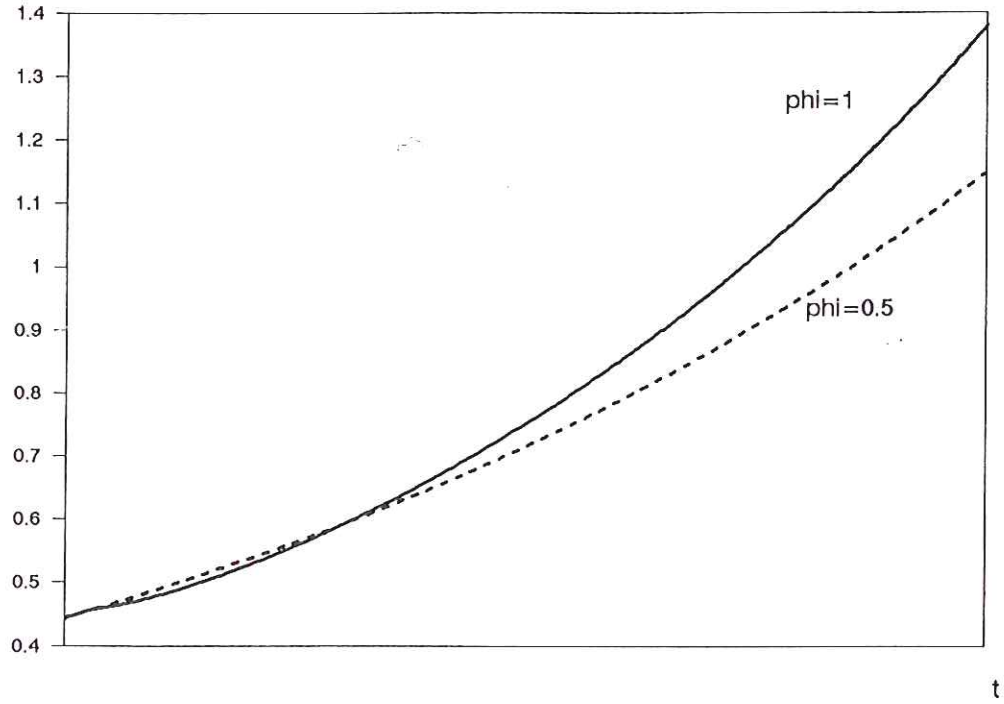


Figure 3.6



K

Figure 3.7



DISCUSSION PAPER SUBSCRIPTION FORM

Subscriptions may be placed for all CEPR Discussion Papers or for those appearing under one or more of the Centre's five research programme areas: International Macroeconomics, International Trade, Industrial Organization, Financial Economics and Human Resources.

Subscription orders will be invoiced quarterly in arrears. The charge will be determined by the number of papers sent during the preceeding three months. Invoices will be sent on 31 March, 30 June, 30 September and 31 December. New subscriptions must start from one of these dates. If no starting date is specified, the subscription will be started from the beginning of the next period. Papers are charged at the rate of £3 ($5). Individual academics may obtain papers at the concessionary rate of £2 ($3). To qualify for this concession, the declaration below (*) must be signed.

Back copies of papers from number 600 are available. For more details, and information on out of print papers contact the Centre.

I wish to place a subscription for:

- ☐ International Macroeconomics (IM) Discussion Papers
- ☐ International Trade (IT) Discussion Papers
- ☐ Industrial Organization (IO) Discussion Papers
- ☐ Financial Economics (FE) Discussion Papers
- ☐ Human Resources (HR) Discussion Papers

☐ *I wish to take advantage of the concessionary rate for individual academics. I am affiliated to an academic institution and will finance my subscription personally.

I want my subscription to start: ☐ 1 January ☐ 1 April ☐ 1 July ☐ 1 October

Name _____

Affiliation (if applicable) _____

Address _____

_____

_____

_____

Vat No. (if any) _____

Telephone _____ Fax _____

Signature _____ Date _____

Invoice Address if different from delivery address:

_____

_____

_____

Upon receipt of an invoice payment must be made by the date on the invoice in one of the following methods: i) Sterling cheque drawn on a UK bank; ii) Sterling Eurocheque endorsed with your card number; iii) US dollar cheque drawn on a US bank; iv) Credit card (VISA/Access/Barclaycard/Eurocard/Mastercard) – please quote card type, number and expiry date; v) Bank transfer in Sterling to our bank – please contact CEPR for details of our bank account.

Return this form to 'The Subscription Officer', at the address below.

✂ ----------

CEPR, 25–28 Old Burlington Street, London W1X 1LB. Tel: 44 71 734 9110. Fax: 44 71 734 8760.