

On the Real Effects of Financial Development

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Abstract

We study a simple model of financial and economic development based on consumption of real resources by the financial sector and constant returns to scale in accumulation of physical capital in the production sector. Transition from financial autarky to financial intermediation and firm-production is associated with a process of reallocation of resources toward more productive investments and financial services. We find that the immediate growth impact of financial development is ambiguous: transition might lead to a period of output decline. Redistribution policies which do not alter the timing of the transition imposed by the market forces could be not enough to offset the possible negative growth effects associated with the transition process, and to prevent "poverty traps" (structural recessions) possibly associated with premature emergence of financial intermediation.

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1. Introduction

In the last ten years a substantial body of literature dealing with the interaction between financial and economic development has been produced. Most of the contributions stress that financial development enhances lending and equity financing to firms thereby improving upon efficiency in the allocation of savings. Accordingly, financial development stimulates long run growth whenever conditions for endogenous growth to occur are satisfied. This general result is subject to a serious qualification to the extent that financial development has ambiguous consequences on agents' saving behaviour. In particular, when it comes in the form of consumer lending or insurance devices it might result in a reduction the propensity to save [see Pagano and Jappelli (1994, 1999)].¹

Independently of the possible negative effects on the propensity to save, another source of ambiguity regarding the growth inducing power of financial development is the absorption of economic resources which is inevitably associated with a system of financial transactions in presence of market imperfections. The process of economic development and financial deepening is intrinsically associated with a process of reallocation of economic resources. Resources are reallocated to more productive and capital intensive technologies, and, whenever financial markets are not perfect, to the financial services sector which allows for the necessary mobilisation of savings. The development of a financial system that allows for savings to flow efficiently from savers to investors, is a key factor in determining the successfulness of such a transition process. However, many historical examples can be provided in which financial institutions emerging at the early stages of development have failed to play a positive role in fostering the process of economic growth. Yet, as Fry reports, "[...] most of the developing countries possess highly inefficient financial institutions with neither the incentive nor the expertise to improve domestic resource mobilization and allocation [...]"; (Fry, 1995, p.454).

There is evidence that most of the East Europe (EE) countries undergoing transition to market based production in the early 90s, faced deep recessions and high unemployment rates for few years after the starting of the transition process.² Blanchard (1997) refers to this phenomenon as to 'transformational

¹ Another traditional argument has been that financial development resulting in higher productivity of capital reduces the marginal propensity to save as long as, given agents' preferences, the income effect induced by an higher return on savings dominates the related substitution effect. Also financial development that enhances risk diversification could have the same ambiguous on savings and on the growth rate; see Obstfeld (1994).

² For instance, as reported by Blanchard (1997, pages 2 and 3): "the figures show a decline

recessions'.³ According to this interpretation, the contraction of output at the early stages of transition results from the fact that the productivity gains due to the process of reallocation of economic resources might be not strong enough to compensate for the production losses associated with the dismantling of the old production system, and the implementation of the service sector necessary to market transactions. Indeed, newly created service sectors, tend to be not cost-effective, or, in more general terms, inefficient, in the early stages. This argument has been also applied to the specific case of financial services which play a key role in market economies, as pointed out by Blanchard et al (1992, page xvi): "[...] if restructuring is to be successful, most investment must now go to the establishment and expansion of new firms. This in turn requires both the appropriate amount of national saving and a financial intermediation structure that can efficiently channel saving from lenders to borrowers [...]". However, "[...] the creation of an efficient intermediation process does by necessity take time [...] as the building of both competence and expertise in banking is nearly by essence a process of learning by doing that takes years [...]", [Blanchard et al, 1992, page 78].

In our view, the idea behind the concept of transformational recession adopted by Blanchard in the context of EE economies could be applied, more generally, to shed light into why, in the early stages, financial development might be not growth conducive. Indeed, the process of financial and economic development is characterised by a transformation of the production structure. This seems to be the case not just for ex-centralised EE economies, but also for developing economies facing transition from pre-industrial or rural production to industrialisation, or, to put it more generally, to a modern market-based production system. Yet, the crucial question to be answered is how the emergence of non-growth inducing financial institutions (possibly exerting a negative net impact on production activity) can be sustained as an equilibrium in an economy characterised by maximising agents.⁴

In order to attempt an answer to this question we build an overlapping gener-

of output for between two years (Poland) and four years (Bulgaria), and a recovery since [...]". Moreover, there is the extreme case of the Russia economy which has been experiencing a seemingly endless recession characterised by a large decline in output, since the starting of the transition process.

³ Blanchard notes he is adopting Komai's (1994) expression here.

⁴ Other authors, like for instance Lee (1996) have analysed the issue of improvements in the efficiency of financial intermediation along the process of economic development. Yet, these studies do not focus on how inefficient, or cost-ineffective, could financial intermediaries be provided that they emerge endogenously as a consequence of the behaviour of maximising agents.

ations (OLG) endogenous growth model based on a learning by doing externality which implies constant returns to scale in physical capital accumulation at an aggregate level. In the model there are two possible financial regimes: financial autarky, in which each individual runs production activity, and financial intermediation, in which production is delegated to firms which have access to a more productive and capital intensive technology than individuals. The transition from financial autarky to financial intermediation with the formation of a financial sector which channels funds to firms occurs whenever it yields a higher return to savers than engaging in self-funded individual production. Accordingly, since financial transaction costs are assumed to be fixed, financial intermediation emerges endogenously as the economy reaches a critical level of economic development. To this extent the model is close to other previous work in the area of finance and growth, like for instance Saint-Paul (1993), Greenwood and Jovanovic (1990).⁵

Financial transactions improve productivity of capital but also absorb economic resources. These two effects flow through the learning by doing externality with opposite consequences on capital accumulation and therefore on future levels of output and growth rates. In general the net outcome is ambiguous. More precisely, financial development affects both the return on capital and that attached to labour in such a way that, depending on the amount of resources consumed in the course of intermediation, the transition process might entail a total output loss while still guaranteeing an higher net return to savings compared to financial autarky. Under these circumstances, market forces determine the emergence of a financial sector which has an immediate negative impact on growth. This stems from the fact that while the generation responsible for the transition enjoys an higher return to savings, the negative consequences induced by the net output reduction are experienced by future generations of workers. Moreover, even in cases in which the immediate growth impact of transition is positive, the economy might still experience lower growth rates in the period immediately after transition. These results hold despite of the fact that the economy under financial intermediation would ultimately reach an higher growth rate than that under financial autarky, provided that the conditions necessary to self-sustainable development under financial intermediation are satisfied.

We analyse the potential role of public intervention. Financial development might fail to result in a (Potential) Pareto improvement. This directly implies that redistribution policies alone could not be enough to offset the negative growth

⁵ However differently from them we focus on the absorption of real economic resources which is associated with financial transaction costs.

effects which might be initially induced by financial development. Also, redistribution policies which do not alter the timing of transition imposed by the spontaneous market forces, could be not enough to avoid "poverty traps" (structural recessions) which in extreme cases might be associated with the transition process. Therefore, "hands-off" financial liberalisation might fail to promote development even if supported by redistribution policies. To this extent, attracting foreign savings, or postponing transition by means of (partial) financial repression might play an important part. Indeed, "[...] full-blown financial liberalisation is not a prerequisite for spectacular growth [...]", [Fry, 1995, page 463].⁶ To the extent that there are very strong reasons why it might be difficult for a country at the early stages of financial and economic development to be able to attract foreign savings or even more foreign direct investments, the role of public policies aimed at regulating the process of financial liberalisation and supporting the emergence of efficient financial institutions⁷ might be very important.

The paper is structured as follows. Section 2 describes the structure of the model. Sections 3 analyse the endogenous emergence of financial transactions and the related growth effects. Section 4 analyses equilibrium dynamics subsequent to transition. Section 5 deals with the welfare effects of financial development and the possible role that public intervention might have in improving upon the equilibrium spontaneously generated by the laissez faire economy. The final section is left for conclusions.

2. The model

The economy is composed of a continuum of size H of individuals and a continuum of size H of firms. The population of individuals has a standard OLG structure with individuals living for two periods. Individuals have identical preferences and derive utility from consumption over the two periods of life according to

⁶ On the contrary, "[...] (m)any developing countries have committed to enhance mobilisation of savings by fostering the process of financial development. To this end they have made various changes in the structure and operations of their financial systems under the rubric of financial development, liberalisation, or reform.", (ibid, p.454). However, "[...] the experience of these efforts has been disappointing in the extreme [...]", (ibid, p. 454). Historical evidence shows that in many instances the rapid growth in lending activity after liberalisation did not result in a better allocation of resources than did direct credit policies or other allocative mechanisms under financial repression, (see Vittas (1992), and Villanueva and Mitakhor (1990)).

⁷ For instance, Blanchard et al (1992) suggest that governments should set up programs to train accountants, loan officers, and others.

$U = \log c_{t+1} + \beta \log c_t$ where β is the intertemporal subjective discount factor. Each young individual is endowed with a unit of labour which he/she supplies inelastically to producers earning a salary w_t . The salary is partly consumed and partly saved by young agents. Savings are expressed either in the form of self-funding of physical investment related to individual production, or deposits issued by financial intermediaries.

Production is carried out either by individuals or firms. In any case, producers operate under perfect competition. The production function has this general expression: $Y_t = A_t K_t^{\alpha} L_t^{1-\alpha}$, where Y_t is the output produced using L_t units of labour and K_t units of capital, given the external effect $A_t = K_t^{\lambda}$, with $k_t = K_t/L_t$ and the productivity parameter, A . We assume that firms (F) have access to a more productive and capital intensive technology than individuals (I), i.e. $A^F > A^I$, with $\alpha^F > \alpha^I$. Note that we also impose $(1 - \alpha^I)A^I < (1 - \alpha^F)A^F$ to ensure that not only the marginal return on capital but also the marginal return on labour is higher under the technology available to firms than under the individuals' technology, for any given value of the capital/labour ratio⁸

2.1. Saving behaviour and the financial sector

The above assumptions about the return to capital associated with the two technologies provide the only justification for financial transactions in the model. According to these assumptions, the equilibrium return to capital is higher under firms' production than it is under individuals' production. Therefore, individuals have an incentive to save via lending to firms rather than self-financing. However, we assume that lending entails a fixed consumption of physical resources by an amount E . The presence of a cost reduces profitability of financial transactions. Being fixed, its adverse effects on profitability are mitigated as the volume of financial transactions operated by savers increase. In other words, as the volume of financial transactions increases the intermediary becomes more 'cost-effective'. This standard argument motivates the endogenous emergence of financial transaction at some stage of economic development.

Due to fixed financial transaction costs, lenders have an incentive to delegate the lending task to a single intermediary, which, for simplicity, we call bank. The bank pools savings issuing deposit contracts which pay a gross interest rate r^d , and lends to firms at a gross interest rate r^l . Individuals' choice between self-

⁸ These assumptions are imposed to guarantee that the technology available to firms dominates that of the individuals for any given level of k_t .

...nancing and deposits as alternative saving devices, will depend on the level of r^d compared to the equilibrium rate of return on self...nancing call it r_t^e . They will choose self...nancing (deposits), as long as $r^d < (s) r_t^e$ as discussed in the following of the paper.⁹

Independently of the saving device used, the optimal level of savings is equal to sw_t where $s = \frac{1}{2}(1 + \frac{1}{2})$.¹⁰

2.2. Production

At each time t producers invest physical resources into the production process. At period $t+1$ the resulting accumulated capital is combined with labour to produce. Since markets are perfectly competitive both labour and capital are paid their marginal returns. It follows that, in the case of individuals' production, we have $w_t = (1 - \beta) \hat{A}^I k_t^{i-1} A_t$ and $r_t^e = \beta \hat{A}^I k_t^{i-1} A_t$. Similarly, in the case of firms' production we have $w_t = (1 - \beta) \hat{A}^F k_t^{i-1} A_t$ and $r_t^e = \beta \hat{A}^F k_t^{i-1} A_t$. In equilibrium $A_t = k_t^{1-i}$ holds (with $i = F; I$ depending on whether the producers are individuals (I) or firms (F)), so that $w_t = (1 - \beta) \hat{A}^i k_t$, with $i = F; I$, $r_t^e = \beta \hat{A}^i$, and $r_t^e = \beta \hat{A}^i$ follow.

2.3. Equilibrium: growth under the two regimes

We assume complete depreciation of capital. Therefore, under financial autarky, given the level of aggregate savings, sw_t in equilibrium, the level of $t+1$ production, y_{t+1} , is $s \hat{A}^i w_t$. Given that $w_t = (1 - \beta) \hat{A}^i k_t$ holds, the dynamic law of motion of aggregate product is $y_{t+1} = s(1 - \beta) \hat{A}^i y_t$. Correspondingly, the growth rate of the economy is simply $s(1 - \beta) \hat{A}^i - 1$.

Under financial intermediation the net aggregate flow of savings channelled toward investment is $sw_t - E$. Therefore, in equilibrium, time $t+1$ aggregate product is $\hat{A}^F [sw_t - E]$. Given that $w_t = (1 - \beta) \hat{A}^F k_t$ holds, the dynamics of

⁹ In strict terms if $r^d = r_t^e$, individuals are indifferent between the two alternatives. However, without loss of generality, we conveniently assume, according to standard principles, that in this situation agents will choose to save in form of deposits.

¹⁰ Note that, given the logarithmic form of the utility function, the propensity to save, s , is independent of rate of return on savings. Accordingly, individuals' optimal saving decision does not depend on the saving device used. This assumption is useful to the extent that it allows us to isolate our analysis from the effects induced by financial development on agents' propensity to save.

aggregate product is given by: $y_{t+1} = \hat{A}^F [s(1 - \theta^F) + E=y_t]y_t$ and the growth rate of the economy is $g_t = \hat{A}^F [(1 - \theta^F)s + E=y_t] - 1$.

2.4. Equilibrium: ...nancial autarky vs ...nancial intermediation

The equilibrium can be either characterised by ...nancial intermediation or ...nancial autarky. In the ...rst case, individuals save through deposits and production is delegated to ...rms. In the second case, production is carried out directly by individuals who save through self...nancing. As we said, since ...nancial transaction costs are ...xed, a single bank operates in the credit market as a monopolist. Free entry is assumed. Therefore, in equilibrium, the bank does zero profits. Henceforth, for given volume of aggregate deposits equal to D_t , the relationship $r_t^d D_t = r_t^l (D_t + E)$ holds. In turn, given that in equilibrium, $r_t^l = \theta^F \hat{A}^F$, $r_t^d = \theta^F \hat{A}^F (1 - E=D_t)$ follows.

Given the level of individual labour income, w_t , the potential aggregate volume of deposits which the bank could have access is $D_t = sw_t$. As we already explained, savers will buy deposits if and only if $r_t^d \geq r_t^e$ holds. In equilibrium, $r_t^e = \theta^l \hat{A}^l$. Hence, the economy will operate under ...nancial autarky as long as $w_t < w^c = E \theta^F \hat{A}^F / (s(1 - \theta^l) \hat{A}^l)$, or, considering that $y_t = w_t (1 - \theta^l)$, for values of per capita income y_t such that $y_t < y^c = E \theta^F \hat{A}^F / [s(1 - \theta^l) (\theta^F \hat{A}^F + \theta^l \hat{A}^l)]$; holds.¹¹ On the other hand, the economy will operate under ...nancial intermediation for $y_t \geq y^c$.

3. Endogenous transition to ...nancial intermediation

Assume that the level of per capita output is initially lower than the critical value y^c . The economy would then operate under ...nancial autarky. As long as the growth rate is positive, at some period T , the economy will ...nally reach a level of y_t ; call it y^T , such that $y^T \geq y^c$ holds. As the process of economic development reaches this stage, a bank pooling all savings could offer a rate of return on deposits higher or equal to the equilibrium rate of return on self...nancing as previously discussed. Individuals will then ...nd it convenient to save through deposits: transition from ...nancial autarky to ...nancial intermediation occurs.

¹¹ Substituting for the equilibrium value of r_t^d , we ...nd that the condition $r_t^d \geq r_t^e$ is satisfied as long as $w_t < w^c \stackrel{\text{def}}{=} E \theta^F \hat{A}^F / (s(1 - \theta^l) \hat{A}^l)$ holds.

Note that y^T will be surely lower than $y^{T:\max} = y^c s(1 - \theta^1) \hat{A}^1$.¹² The growth rate of the economy in the transition phase is $g^T = \hat{A}^F [(1 - \theta^1) s; E = y^T]_i - 1$.¹³ Such a growth rate is greater than the growth rate under financial autarky if and only if y^T is greater than $y^c = E \hat{A}^F = [s(1 - \theta^1) (\hat{A}^F - \hat{A}^1)]$. We note that as long as $y^c > y^c$ holds there exist possible values of y^T such that transition to financial intermediation entails a negative growth effect in the transition period. Moreover, whenever the maximum level of development attainable before transition, $y^{T:\max}$, is lower than y^c , the immediate growth impact of transition is surely negative. Pairwise comparisons of y^c with y^c and $y^{T:\max}$ yield the following

Result 1. i. If $\theta^F > \theta^1$ holds, the immediate growth effect of the transition from financial autarky to financial intermediation is ambiguous. ii. If $s(1 - \theta^1) (\hat{A}^F - \hat{A}^1) < \hat{A}^F - \hat{A}^1 = \theta^1 = \theta^F$ holds, the growth effect of the transition is unambiguously negative.

Proof of Result 1. Effects of financial development are negative for $y^T < y^c$ and positive otherwise. On the other hand financial development requires $y^T > y^c$. Accordingly, transition toward financial development yields ambiguous growth effects if and only if $y^c > y^c$ holds. Given the expressions for y^c and y^c it could easily be verified that the inequality $y^c > y^c$ reduces to $\theta^F > \theta^1$, where this inequality corresponds to the assumption that firms adopt a more capital intensive technology. [this ends part i]. We know from previous discussion that $y^T \in [y^c, y^{T:\max} = y^c s(1 - \theta^1) \hat{A}^1]$ holds. Then, provided $y^c > y^c$ holds, two possible cases emerge: i. $y^c < y^{T:\max}$; ii. $y^c > y^{T:\max}$. In case i the growth effects of transition can be either negative, which is the case if $y^T \in [y^c, y^c]$, or positive, which is the case if $y^T \in (y^c, y^{T:\max})$. In case ii y^T is lower than y^c for any possible value of y^T so that the growth impact of the transition is unambiguously negative at least in the transition period. Using the expressions for $y^{T:\max}$ and y^c the inequality $y^c > y^{T:\max}$ (which implies $y^T < y^c$) reduces to

¹²The maximum level of income such that the economy operates under financial autarky can be intuitively defined as $y^a = y^c - \epsilon$, where ϵ is a "very small" positive number, i.e. a positive number infinitely close to zero ($\epsilon \rightarrow 0^+$). Consequently, given the dynamic law of motion for output under financial autarky, the maximum level of output attainable before switching to financial intermediation, $y^{T:\max}$, is equal to $s(1 - \theta^1) \hat{A}^1 y^a$ which is strictly lower than $s(1 - \theta^1) \hat{A}^1 y^c$.

¹³Note that under financial autarky wages are given by $w_t = (1 - \theta^1) y_t$. Therefore the flow of savings in the transition period is equal to $s(1 - \theta^1) y_t$. This is different from what would happen when the economy is already operating under financial intermediation in which case $w_t = (1 - \theta^F) y_t$ holds.

$s(1 - \theta^I)(\hat{A}^F - \hat{A}^I) < \hat{A}^F - \hat{A}^I - \theta^I = \theta^F$. We note that in order for this inequality to be satisfied the condition $\theta^F > \theta^I$ must be fulfilled. \square

Discussion. In the limiting case in which financial transactions were costless, our economy would always operate under financial intermediation, thereby experiencing a growth rate equal to $\hat{A}^F(1 - \theta^F)s_{t-1}$ which is greater than that under financial autarky.¹⁴ However, this simple model shows that in presence of resources' absorption due to financial transactions, transition from financial autarky to financial intermediation might have an immediate negative impact on growth even if financial transactions enhance productivity of investment. Crucial to this result is the assumption that firms use a more capital intensive technology than the one available to individuals (i.e. $\theta^F > \theta^I$). This is actually what one should expect if the transition from individual to firms' production associated with financial development is featured as a process of industrialisation.¹⁵ If transition has a negative growth effect the level of per capita income at time $T + 1$ would be lower than it would have been under financial autarky, i.e. $y_{T+1}^F < y_{T+1}^{FA}$. However, as long as $\theta^F > \theta^I$ the share of product which goes to savers, $\theta^F y_{T+1}^F$ can be still greater than that under financial autarky, $\theta^I y_{T+1}^{FA}$. This explains why, as long as $\theta^F > \theta^I$ non growth including financial development might occur. Note also that whenever $y_{T+1}^F < y_{T+1}^{FA}$, given $\theta^F > \theta^I$, $y_{T+1}^F(1 - \theta^F) < y_{T+1}^{FA}(1 - \theta^I)$ follows. The workers of generation $T + 1$ are made worse off. However, future generations cannot possibly decide against transition, nor they get compensated whenever they experience a loss. This leads to the consideration that the ambiguous effects induced by financial development is, in the model, consistent with the observation that since a market for intergenerational transfers is missing the outcome of the laissez faire economy needs not be Pareto efficient.

¹⁴This is obvious since firms' technology dominates that available to individuals. Otherwise the economy would operate under financial autarky. We note that $\hat{A}^F(1 - \theta^F)s_{t-1}$ is indeed the equal to the growth rate that the economy would reach in presence of fixed costs associated with financial intermediation as y_t approaches infinity.

¹⁵Hansen and Prescott (1998), model the process of industrialisation as the shift from labour intensive to capital intensive technologies.

4. Dynamics

4.1. The transition phase

The process of economic development crucially depends on the effects induced by the transition from financial autarky to financial intermediation. The growth rate associated with the transition period is positive (negative) for y^T greater (lower) than $y^T \leq E\hat{A}^F = [s(1 - \theta^l)\hat{A}^F - 1]$.¹⁶ In the case of negative growth in the transition period, T , two possible cases occur depending on y^{T+1} being smaller or bigger than the minimum income threshold such that financial transactions are convenient, $y_{T+1}^C \leq E^{\theta^F}\hat{A}^F = [s(1 - \theta^F)(\theta^F\hat{A}^F - \theta^l\hat{A}^l)]$.¹⁷ Case 1: $y^{T+1} < y_{T+1}^C$, the economy reverts to financial autarky. Case 2: $y^{T+1} \geq y_{T+1}^C$, the economy will still operate under financial intermediation. In the latter case, as long as the growth rate under financial autarky is positive, after reversion the economy will grow until a new transition toward financial intermediation occurs. The dynamics associated with case 2 will be discussed in the next subsection.

With respect to case 1, the basic questions are whether reversion to financial autarky in the transition period is actually a possible outcome of the laissez faire economy and whether 'vicious cycles' characterised by repeated transition (to) and reversion from financial intermediation could possibly correspond to some 'poverty trap' that the laissez faire economy cannot possibly escape. The answer to this question is:

Result 2. i. If the condition $\theta^F = \theta^l > s\hat{A}^l = (1 + s\theta^l)$ is satisfied, the economy can experience immediate reversion to financial autarky at time $T + 1$; ii. If the condition $1 = (1 - \theta^F) + [\hat{A}^F - \theta^l\hat{A}^l = \theta^F] > (1 - \theta^l)s^2$ is satisfied, transition cannot possibly be completed – the economy is in a 'poverty trap'.

Proof of Result 2. Transition cannot be completed as long as $y^{T+1} < y^T(1 - \theta^l)s\hat{A}^F - E\hat{A}^F < y_{T+1}^C$ holds. We know from previous discussion that $y^T \geq [y^C, y^{T,max}]$: A necessary condition for the economy to experience immediate reversion to financial autarky is that at least for the smallest possible value of y^{T+1} ,

¹⁶Recalling that the growth rate in the transition phase is $g^T = \hat{A}^F [(1 - \theta^l)s - E = y^T] - 1$, it immediately follows that $g^T > (<) 0$ whenever $y^T > (<) y^T \leq E\hat{A}^F = [s(1 - \theta^l)\hat{A}^F - 1]$.

¹⁷Note that the critical value of income such that financial intermediation is profitable in the post transition period, $T + 1$, which we labelled y_{T+1}^C is greater than the correspondent value for the transition period y^C . This is due to the fact that the labour share of total product has changed (negatively) from $1 - \theta^l$ to $1 - \theta^F$.

defined as $y^{T+1;c} = A^F[(1 - \theta^F)s y^c - E]$, the condition $y^{T+1;c} < y_{T+1}^c$ holds. Using the expression for y^c it is immediate to verify that the above inequality holds as long as $s(1 - \theta^L)A^L < \theta^F = \theta^L$ is satisfied [this ends part i]. Transition cannot possibly be completed as long as for the maximum level of income at time $T + 1$, defined as $y^{T+1;max} = y^{T;max}(1 - \theta^L)A^F s - EA^F$, the condition $y^{T+1;max} < y_{T+1}^c$ holds. Substituting for the values of $y^{T;max}$ and y_{T+1}^c , this inequality reduces to $1 = (1 - \theta^F) + [A^F(1 - \theta^L)A^L = \theta^F] > (1 - \theta^L)s^2$. It is important to note in order for this condition to be satisfied, the inequality $s(1 - \theta^L)A^L < \theta^F = \theta^L$ must hold [this ends part ii]. \square

Discussion. Result 2 is an intuitive corollary to Result 1. Given that the growth impact of resource consuming financial intermediation is uncertain, the possibility of turning from positive growth under financial autarky to negative growth under financial intermediation such that the economy immediately reverts to financial autarky in the post transition phase directly stems from continuity.

4.2. The post-transition phase

As we already mentioned assuming the level of per capita income in the post transition phase (i.e. period $T + 1$), y^{T+1} , is greater than y^c the economy still operates under financial intermediation and the growth rate is given by $g_{T+1} = A^F[(1 - \theta^F)s y_{T+1} - E] / y_{T+1} - 1$, which is negative for $y^{T+1} < y^{cp} = EA^F / [A^F(1 - \theta^F)s - 1]$ and positive otherwise. Comparing this growth rate with that associated with the transition phase, and the critical level of income y^{cp} with the maximum level of income attainable at period $T + 1$ yields:

Result 3. i. Whenever $s[(\theta^F - \theta^L)] < E[1 - y^T - 1 = y^{T+1}]$ the growth rate in the post transition is lower than during transition. ii. Whenever $\theta^F = \theta^L > (1 - \theta^F)s\theta^L$ the economy could experience vicious cycles; iii. Whenever the condition $[s(1 - \theta^L)A^L - 1](1 - \theta^F) < [1 - \theta^L = \theta^F]A^L = A^F$ is satisfied the economy experiences a poverty trap.

Proof of Result 3. The growth rates in the transition, and in the post transition phases, are $g^T = s(1 - \theta^L)A^F - EA^F / y^T$, and $g^{T+1} = s(1 - \theta^F)A^F - EA^F / y^{T+1}$, respectively. It then follows immediately that whenever $s[(\theta^F - \theta^L)] < E[1 - y^T - 1 = y^{T+1}]$ holds, the economy experiences lower growth in the post transition phase than under transition. It is worth noting that as long as $g^T < 0$ the above condition is automatically satisfied, so that $g^{T+1} < g^T < 0$ holds; [this ends part

i]. At period $T + 1$, $y^{T+1} = s(1 - \theta^l) \hat{A}^F y^T$; $E \hat{A}^F$ holds. As already mentioned, whenever $y^{T+1} < y^{\text{pr}}$, $E \hat{A}^F = [\hat{A}^F (1 - \theta^F) s_i - 1]$ holds, the economy experiences negative growth in the post transition phase so that y_t eventually shrinks until financial autarky is restored as an equilibrium (vicious cycle). On the other hand, we know that y^{T+1} is at least equal to $y^c(1 - \theta^l) s \hat{A}^F$; $E \hat{A}^F$. Then, it follows that the economy could experience 'vicious cycles' as long as $y^c(1 - \theta^l) s \hat{A}^F < y^{\text{pr}}$. Given the expressions for y^c and y^{pr} this inequality reduces to $\theta^F = \theta^l > (1 - \theta^F) s^{\theta^l}$; [this completes part ii]; We recall that the maximum level of income at time $T + 1$ is $y^{T+1;\text{max}} = y^{T;\text{max}} \hat{A}^F (1 - \theta^l) s_i$; $E \hat{A}^F$: As long as $y^{T+1;\text{max}} < y^{\text{pr}}$ the economy always experiences negative growth in the post transition phase. Given the expressions for y^{pr} and $y^{T;\text{max}}$ this inequality reduces to $[s(1 - \theta^l) \hat{A}^l - 1](1 - \theta^F) < [1 - \theta^l = \theta^F] \hat{A}^l = \hat{A}^F$. ¥ :

Discussion The economic intuition behind result 3 lies in the fact that in the post transition phase, when the capital intensive technology is already in place, the labour's share of total product is reduced compared to the transition phase. As a consequence, even though transition has positive growth effects, so that total product is increased compared to the level it would have reached under financial autarky, workers of the post transition generation might still be worse off since their product share, $1 - \theta^F$, is lower than under financial autarky. In turns, this implies that the growth rate in the post transition period could be lower than that associated with transition.

As per capita income grows, the economy under financial intermediation will eventually experience a higher growth rate than the economy under transition, so that the existence of a financial sector has eventually positive growth effects.¹⁸ However, Result 3, together with Results 1, and 2, suggest the possibility of a non-monotonic relationship between financial and economic development. This is consistent with the recent experience of many transition economies, which have experienced long recession periods, in association with the reallocation of resources toward production and (financial) services induced by the transition process, and more generally with the historical experience of many developing economies in which financial development (often induced by financial liberalisation policies) has not produced beneficial consequences in terms of growth.¹⁹

¹⁸ Note that as per capita income goes to infinity the growth rate under financial intermediation reduces to $s(1 - \theta^F) \hat{A}^F - 1$.

¹⁹ The cases of Latin American countries like Argentina, Colombia, Brazil, and Mexico among the other are illustrative examples of non-growth inducing financial development subsequent to

5. Welfare implications and public intervention

Having analysed the non-monotonic relationship between economic and financial development and the related dynamics of per-capita income emerging from the model, we now turn to investigate the welfare effects of transition toward financial intermediation. We focus on who loses and who gains from the transition, and we analyse under which conditions the transition process induces a (Potential) Pareto improvement. In our view this analysis sheds some light on the nature of the results we derived in the previous sections as well as on the possible role for public intervention.

There are obvious reasons why growth and welfare implications of the transition process are related issues. For instance, it is obvious that whenever the transition process has an immediate detrimental effect on growth, future generations' welfare is adversely affected.²⁰ However, if it is clear that growth harming transition has negative welfare implications,²¹ the financial welfare effects of the transition are less clear whenever the initial growth effects are positive, since in the post transition period the growth rate might be lower than in the transition phase.

Transition takes place at time T . In principle we should be looking at welfare effects induced on generation T as well as on all future generations. However, by adopting of the (Potential) Pareto improvement criterion we can reach some general conclusions looking at generations T , $T + 1$, and $T + 2$, only. We initially focus on two specific cohorts of individuals: the members of generation T , and members of generation $T + 1$, who are born in the period after transition occurs. Members of generation T , are the only responsible for the transition; therefore, they must necessarily gain, otherwise they would not implement it. In fact, their gain per unit of saving is given by the difference between the return on deposits, r_t^d and the rate of return on self-financing r_t^e . Therefore, given the expressions for aggregate savings, r_t^e and r_t^d , the overall gain for generation T can be expressed as $G_T = s(1 - \alpha) y^T [\alpha^F A^F - \alpha^I A^I] - \alpha^F A^F E$.

financial liberalisation. More generally, the possibility of a non monotonic relationship between finance and growth could be also an explanation of why Demetriades and Hussein (1996) fail to find robust cointegration between financial deepening and the level of economic development in one third of the countries in their sample. Furthermore evidence of a negative relationship between finance and growth is found by Ram (1999) in a sample of 95 countries.

²⁰We actually mean that agents would be surely better off if the transition process was postponed.

²¹If the growth impact of the transition is negative, the level of per capita income of future generations will be surely lower than if the transition process would have occurred later on.

Regarding members of the post transition generation, $T + 1$, they will experience a loss (gain) as long as time $T + 1$ wages, w_{T+1} , are lower (higher) than they would have been under financial autarky.²² Given the value of y_T we have $w_{T+1} = (1 - \tau^1)^2 s^1$ under financial autarky and $w_{T+1} = (1 - \tau^F) \Delta^F [(1 - \tau^1) s y_T - E]$ under transition. Comparing these two expressions yields that members of generation $T + 1$ gain from transition whenever $y_T > (1 - \tau^F) E \Delta^F = fs(1 - \tau^1) [(1 - \tau^F) \Delta^F - (1 - \tau^1) \Delta^1] g^{-1} y^P$.

Whenever y^T is lower than y^P the question is under which conditions transition is still a potential Pareto improvement, provided is not a Pareto improvement strictu sensu, given that members of generation $T + 1$ are experiencing a loss. Obviously, whenever transition to financial autarky entails detrimental (positive) growth effects the size of the 'cake' to be shared by generation T and generation $T + 1$, at time $T + 1$, i.e. y^{T+1} , will be lower (higher) than under financial autarky. Henceforth, transition results in a Potential Pareto Improvement for generation T , and $T + 1$, together, if and only if $y^T > y^c$ holds, where y^c is the critical level of income such that for all $y^T > y^c$ the growth effects of transition are positive as defined earlier on in the discussion.

Whenever the transition entails a (Potential) Pareto Improvement for generation T and $T + 1$, conditional on $g^T < g^{T+1}$ it can be regarded as a (potential) Pareto improvement on overall, i.e. considering also subsequent generations' welfare. However, we know that the period immediately after transition could be characterised by a growth rate lower than that under transition (see Result 3), i.e. $g^T > g^{T+1}$. Therefore, transition entails non trivial welfare implications also for members of generation $T + 2$. Given the level of income at period T , the overall per-capita income is $y^{T+1} = y^T \Delta^F (1 - \tau^1) s - \Delta^F E$, so that per-capita income at time $T + 2$ is $y^{T+2} = [y^T \Delta^F (1 - \tau^1) s - \Delta^F E] (1 - \tau^F) \Delta^F s - \Delta^F E$. Young agents of generation receive a fraction $(1 - \tau^F)$ of y^{T+2} , while under financial autarky they would receive a fraction $(1 - \tau^1)$ of a total per capita income equal to $y^T [s(1 - \tau^1) \Delta^1]^2$: Comparing the fraction of income received by generation $T + 2$ under the two regimes yields that transition at time T , results in a Pareto improvement for this generation whenever:

²² Note we do not consider the fact that after transition the return on savings for generation $T + 1$ is r_{T+1}^d (provided that financial intermediation is still in place) rather than that on self-financing r^e . This is because the option to save through deposits is available to members of generation $T + 1$ independently of the fact that transition toward financial intermediation has already occurred.

$$y^T > y^{PI;T+2} \iff \frac{\hat{A}^F E[(1+i^F)\hat{A}^F s_{t+1}]}{[s^2(1+i^L)][(1+i^F)\hat{A}^{F^2} + \frac{(1+i^L)^2}{(1+i^F)}\hat{A}^{L^2}]}$$

is satisfied.

Similarly comparing the level of total per capita income at time $T + 2$ under the two regimes we find that transition results in a potential Pareto improvement for generation $T + 2$ whenever:

$$y^T > y^{PPI;T+2} \iff \frac{\hat{A}^F E[(1+i^F)\hat{A}^F s_{t+1}]}{[s^2(1+i^L)][(1+i^F)\hat{A}^{F^2} + (1+i^L)\hat{A}^{L^2}]}$$

holds.²³

Once we take into account welfare of generation $T + 2$, we could ask whether transition at time T entails unambiguously positive welfare effects as long as it has an immediate positive effect on growth, i.e. for $y^T > y^c$.

Result 4. Transition might fail to yield a (Potential) Pareto Improvement even if the growth rate in the transition period is higher than under financial autarky.

Proof of Result 4. We already know that transition leads to a potential Pareto Improvement for generations T and $T + 1$ whenever $y^T > y^c$ holds so that g_T is higher than the growth rate under financial autarky. Yet, as long as $y^c < y^{PI;T+2}$, for values of $y_{t=2}$ ($y^c, y^{PI;T+2}$); transition improves welfare of generations T , and $T + 1$, while making agents of generation $T + 2$ worse off. Moreover, as long as $y^c < y^{PPI;T+2}$, for values of $y_{t=2}$ [$y^c, y^{PPI;T+2}$] the transition process fails to guarantee even a potential Pareto Improvement when welfare of generation $T + 2$ is considered. Using the expressions for y^c and $y^{PPI;T+2}$ we get that the inequality $y^c < y^{PPI;T+2}$ is satisfied whenever:

$$\frac{\hat{A}^F}{\hat{A}^L} [(1+i^F)\hat{A}^L s_t + 1] > [(1+i^L)s\hat{A}^L + 1]$$

²³As long as total income at time $T + 2$ is greater (lower) than what it would have been under financial autarky the "size of the cake" to be shared between old agents of generation $T + 1$ and young agents of generation $T + 2$ is bigger (lower). Correspondingly, the transition does (does not) imply a potential Pareto Improvement when welfare of generation $T + 2$ is taken into account.

which is surely satisfied for a level of $\hat{A}^F = \hat{A}^I$ sufficiently high.²⁴ Note that since $y^{PP;T+2} < y^{P;T+2}$ holds, whenever $y^c < y^{PPI;T+2}$ holds, $y^c < y^{PI;T+2}$ holds as well. \textsterling

5.1. Can public policy prevent transition/post-transition poverty traps?

According to results 1; 2 and 3 the laissez faire economy can be characterised by premature financial development to the extent that the transition process might have immediate negative effects on growth. In extreme cases such the premature development of financial services is bound to compromise chances of long run sustainable development. The above welfare analysis shows that transition does not necessarily guarantee a potential Pareto improvement. Turning to public intervention this means that redistribution policies might be not enough to offset the potentially Pareto inefficient outcome of the laissez faire economy. In other words, the spontaneous development of a financial sector might fail to promote growth in the early stages even in presence of redistribution policies. An interesting question is whether redistribution policies could at least prevent vicious cycles and poverty traps. Consider, for instance, the case of redistribution of generation T gains to members of generation T + 1. In particular, assuming that all the overall gain G_T was redistributed to them, each young member of generation T + 1 would have an income equal to

$$y^{T+1;R} = G_T + W_{T+1} = s(1 - \theta^I) y^T [\hat{A}^F - \theta^I \hat{A}^I] - E \hat{A}^F;$$

The lowest possible value of y^T is y^c .²⁵ Substituting for its value into the above expression yields:

$$y_{\min}^{T+1;R} = \frac{E \hat{A}^F \hat{A}^I \theta^I (1 - \theta^F)}{(\theta^F \hat{A}^F - \theta^I \hat{A}^I)}.$$

Comparison with y^c yields:

$$y^c > y_{\min}^{T+1;R} \quad () \quad s \hat{A}^I (1 - \theta^I) < \frac{\theta^F}{(1 - \theta^F) \theta^I};$$

As long as this condition is satisfied any redistribution policy which does not alter the incentives of generation T to introduce financial transactions (at time

²⁴We recall here that $\hat{A}^F = \hat{A}^I$ is greater than 1.

²⁵We recall that y^c is the critical value of per capita income such that for $y^T > (<) y^c$ the economy operates under financial intermediation (autarky).

T) might fail to bring the economy out of a vicious cycle in the transition phase. In other words the economy might revert to financial autarky even in presence of redistribution policies. Moreover, given the expression for the maximum value of y^T , i.e. $y^{T,max}$, whenever

$$s(1 - \theta^I)A^{F\theta^I} < \theta^F = (1 - \theta^F)$$

holds, a redistribution toward generation $T + 1$ is surely not enough to escape the poverty trap.²⁶

We do not regard the model as the appropriate device to design the details of what would be an appropriate public policy in support of the early stages of the process of financial and economic development. However, we can still point out that the above analysis suggests that "hands-off" financial liberalisation might yield fail to promote development even if supported by redistribution policies. Attracting foreign savings, or postponing transition toward financial development by means of (partial) financial repression might be therefore useful. To the extent that there are very strong reasons why it might be difficult for a country at the early stages of the transition process to be able to attract foreign savings or even more foreign direct investments, the role of public policies aimed at fostering cost-effectiveness, and efficiency of financial institutions, as well as gradual approach to financial liberalisation might become, in our view, essential to the successfulness of financial liberalisation and subsequent financial development in terms of economic growth.

6 Conclusion

It is a general view in the literature that financial development guarantees a better allocation of savings thereby inducing positive long run growth effects whenever conditions for endogenous growth are satisfied. Yet, many historical examples of transition and developing economies show that while the existence of financial services is a precondition for economic development, in many instances, the financial institutions spontaneously generated by the market economy are not efficient enough to promote growth. We develop a theoretical model in which transformational recessions might occur as the economy moves toward more capital intensive

²⁶The same logic could be used to analyse the role of redistribution policies in the post transition phase. That analysis would yield similar results to those discussed here.

and productive technologies while developing the financial sector which guarantees the necessary mobilisation of savings. Therefore, the model, offers a simple theoretical justification of why non growth inducing financial institutions might emerge at the early stages of financial and economic development. The welfare implications of the model are not trivial to the extent that the transition might fail to result in a Potential Pareto Improvement even in cases where transitional growth effects are initially positive. For this reasons, public redistribution policies which do not alter the timing of the transition phase might be not enough for the economy to escape the possibility of temporary as well as structural recessions, i.e. poverty traps which might be associated with the transition process. From another perspective this seems to suggest that fostering the transition toward financial intermediation by means of "hands off" liberalisation policies might induce negative consequences on the growth rate of the economy whenever market forces have too strong incentives to reallocate resources toward firms' production and cost ineffective financial services.

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