Status Preference and World Economic Dynamics

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July 2003

Abstract

In our model we analyze the role of status preference in a decentralized, two-country world economy. We specify that status preference depends on average consumption and investigate the implications of allowing the two countries to have di®erent attitudes toward status. Among our results, we show that steady-state domestic consumption and the world speed of adjustment are solved for simultaneously if the two countries have di®erent attitudes toward status. An implication of this result is that a shift in status preference in the home country redistributes consumption globally. We show that the direction of the shift depends on how a change in home country status preference changes the domestic intertemporal elasticity of substitution relative to its foreign counterpart.

JEL Codes: E21, F41

Key Words: Status Preference, Consumption Externalities, Open Economy Dynamics

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1. Introduction

A recent development in macroeconomic research is the study of the implications of status preference for growth and development. Evidence that status considerations play an important role in decision making has been provided by authors such as Easterlin (1974, 1995), Clark and Oswald (1996), Oswald (1997), and Frank (1997). In the dynamic macroeconomics literature there have been two principle ways in which status has been modelled. The ¯rst approach assumes that an agent's status depends on the comparison between his consumption and the average level of consumption in the economy. This speci¯cation has been used by researchers such as Gali (1994), Persson (1995), Harbaugh (1996), Rauscher (1997b), Grossmann (1998), Ljungqvist and Uhlig (2000), and Fisher and Hof (2000). A particular version of this model speci¯es that an agent's instantaneous utility depends on both absolute consumption and absolute consumption relative to average consumption. This speci¯cation of status preferences [see, for example, Rauscher (1997b) and Fisher and Hof (2000)] is frequently termed the \relative consumption" case. A related approach assumes that agents compare current consumption to some measure of past consumption history, or \habits", a case that has been analyzed recently by Carrol, Overland, and Weil (1997, 2000) as well as by Ljungqvist and Uhlig (2000).

The other approach that has been employed to analyze status in macroeconomic models assumes that preferences depend on an agent's holdings of relative wealth, which can consist of holdings of ¯nancial assets, physical capital, or both. This speci¯cation has been recently used by authors such as Corneo and Jeanne (1997), Rauscher (1997a), Futagami and Shibata (1998) in the closed economy framework and by Fisher (2001), Fisher and Hof (2003), and Hof and Wirl (2002) in its small open economy counterpart.

With the exception of small open economy studies of Fisher (2001), Fisher and Hof (2003), and Hof and Wirl (2002), most of the research on the macroeconomic implications of status preference have been conducted in the context of a closed economy. To our knowledge, there is, as yet, no work that applies the insights of the status literature in a two-country, dynamic macroeconomic context. It is the goal of this paper to begin to analyze this issue in a modelling framework in which status preferences in the two economies depend on average consumption. We will employ an instantaneous utility function that encompasses those used by Galí (1994) and Harbaugh (1996). Moreover, the Gali-Harbaugh specification of status preferences used in this paper is consistent with a relative consumption interpretation. In addition to its intrinsic interest, a major reason for introducing status preferences in a two-country context is incorporate heterogeneous agents into the analysis. This is in contrast to the research cited above in which the dynamic macroeconomic equilibrium is derived under the assumption that individuals have identical preferences and make identical choices. While analytically convenient, this is surely a restrictive assumption in studying the effects of status preference, since there is some reason to believe that different individuals have different attitudes toward their relative position in society. The two-country, world economy framework offers a tractable way to study heterogenous agents in a dynamic macroeconomic context, while our Gali-Harbough specification of preferences permits a simple parameterization of agents' attitudes toward status.

Since the mid-1980s, especially after the path-breaking work of Frenkel and Razin (1985), there has been an increasing interest in developing intertemporal optimizing models of the two-country, world economy. An important motivation for these studies was to analyze the spillover effects of the large United States budget and current account deficits of this period. The specific two-country structure employed in this paper assumes a representative agent, infinite horizon framework and builds on the work of researchers such as Devereux and Shi (1991), Turnovsky and Bianconi (1992), Bianconi (1995), Frenkel, Razin, and Yuen, (1996) and Bianconi and Turnovsky (1997). These authors study, among other issues, the effects of domestic public expenditure and tax policies on the rest of the world. While our model will include domestic and foreign public sectors, our focus will be to consider the implications of different attitudes toward status at home and abroad. For simplicity, we will restrict our analysis to the case in which domestic (and foreign) agents are "introspective" with respect to their relative position. That is, agents care — in addition to own consumption — only about average consumption in their own countries and not average consumption in the rest of the world.

Our specification that the two countries have different attitudes toward status has, we believe, interesting implications for the world economic equilibrium. In two-country models that assume identical consumer preferences, [see, for instance, Turnovsky and Bianconi

(1992)], the speed of stable adjustment in the world economy and the level of steady-state domestic consumption are determined recursively. We will show in our heterogeneous agent framework that steady-state consumption at home and the speed of stable adjustment are solved for simultaneously if the two countries have di®erent attitudes toward status. We will show, furthermore, that a shift in status preference in, for instance, the home country will redistribute steady-state consumption between the two countries, which will, in turn, change their long-run net asset positions. In addition, a shift in one country's attitude toward status will alter the common stable rate of adjustment, together with the initial levels of consumption chosen at home and abroad. In particular, we will demonstrate that the qualitative implications of an increase the home country's preference for status depends on whether it lowers or increases the home country's intertemporal elasticity of substitution relative to that of the foreign country. If an increase in domestic status preference reduces the home economy's intertemporal elasticity of substitution relative to its foreign counterpart, then steady-state domestic consumption falls, steady-state foreign consumption rises, and the long-run stock domestically held international assets grows. At the same time, a greater preference for status in the domestic country will raise initial domestic consumption, lower initial foreign consumption, and reduce the world economy's stable speed of adjustment in this case. The opposite chain of events will obtain if, instead, a greater weight placed on placed on status considerations in the home economy compared to foreign economy increases the domestic intertemporal elasticity of substitution relative to the foreign.

This paper will have the following structure. Section 2 of the paper will describe the model and derive the intertemporal world economic equilibrium. Next, in section 3 we will parameterize the world economy and calculate numerically an initial benchmark equilibrium in which the attitudes toward status in the two countries are identical. Relative to this initial benchmark, we then analyze the short and long-run implications of di®erent values of the status parameter at home and abroad. Finally, section 4 will o®er some brief concluding remarks and suggestions for future research, while an appendix will derive mathematical results used in calculating the dynamic equilibrium.

2. The Model

In this section of the paper, we will describe the model and derive the intertemporal equilibrium for the one-good world economy. We specify that the world economy is decentralized and made-up of two countries with consumers, firms, and governments. Using the general approach of Devereux and Shi (1991), Turnovsky and Bianconi (1992), Bianconi (1995), and Bianconi and Turnovsky (1997), the behavior of the two-country, world economy will be analyzed in the context of an infinite-horizon, representative agent framework. The domestic and foreign countries accumulate physical capital, which is traded in a perfectly integrated world capital market. In contrast, we assume that labor is fixed both at home and abroad.[1] In laying-out the structure of the world economy, we will focus on the domestic economy. The foreign economy is defined similarly, with its variables and parameters denoted by "stars." In addition, domestic holdings of physical capital will be indicated with a subscript d, while the subscript f denotes holdings of physical capital by foreign agents.

We assume that the domestic economy (like its foreign counterpart) does not hold nominal assets and is, consequently, real. In this optimizing framework, we specify that the domestic representative agent chooses out of after-tax income a flow path of consumption c, and a rate of domestic, k_d, and foreign, k_d^*, capital accumulation in order to solve the following problem

$$\max \int_0^\infty U(c; C)\, e^{-\beta t} dt; \tag{1a}$$

subject to

$$c + \dot{k}_d + \dot{k}_d^* = (1 - \tau_k)\, r k_d + (1 - \tau_k^*)\, r^* k_d^* - T; \tag{1b}$$

where $\beta > 0$ is the domestic (and foreign) rate of intertemporal time preference, C is the average level of domestic consumption, r is the rental rate on domestic capital, and r^* is the corresponding rental rate on foreign capital. For simplicity, we impose an exclusively source-based international tax regime, which implies that the two governments impose capital taxes only on domiciled physical capital. This means, correspondingly, that gov-

[1] Bianconi (1995) and Bianconi and Turnovsky (1997) do, however, specify an endogenous employment decision.

ernments do not impose residence-based taxes, i.e., taxes levied on income earned abroad.[2] According to (1a), τ_k is the tax rate on domestic capital levied by the domestic government and τ_k^* is the tax rate on domestically held foreign capital levied by the foreign government. In addition, we assume that domestic agents pay domestic lump-sum taxes T.

Since it is crucial for our subsequent results, it is important to describe in some detail the representative agent's instantaneous preferences $U(c;C)$, which we assume are increasing in c and strictly concave. As discussed in the introduction, the instantaneous utility function of an agent in the home country encompasses the specifications used by Galí (1994) and Harbough (1996) and is given by

$$U(c;C) = (1-\alpha)^{-1}\left[\left(cC^{-\gamma}\right)^{1-\alpha} - 1\right]; \quad \alpha > 0; \quad 0 < \gamma < 1; \quad \gamma + \alpha(1-\gamma) > 0; \tag{2}$$

where c is individual level of consumption and C is the average level of consumption in the domestic economy [$U^*(c^*;C^*)$ in the foreign country is similarly defined]. We assume further that consumers in both countries are "introspective" in the sense that they care only about own consumption and average consumption in their own country and not about average consumption abroad. The condition $0 < \gamma < 1$, also assumed by Harbaugh (1996), restricts our analysis to negative consumption externalities. The specification in (2) is, in addition, consistent with a "relative consumption" interpretation of status preferences.[3] The parameter γ can be thought of as representing the "degree of status consciousness." If $\gamma = 0$, then agents place no weight on status considerations in comparison with own consumption, while $\gamma \to 1$ describes the limiting case in which status is the only "good" the consumer cares about.

Returning to the agent's optimization problem, the current value Hamiltonian for the

[2] For a review of the implications of source-based versus residence-based taxation, see Turnovsky (1997), chapter 6, section 3.

[3] Letting $U(c;C) \equiv V(c;c/C)$ denote an instantaneous utility function that depends on c/C, (2) is consistent with a relative consumption interpretation, since:

$$V(c;c/C) = (1-\alpha)^{-1}\left[\left(c^{1-\gamma}(c/C)^{\gamma}\right)^{1-\alpha} - 1\right].$$

home-country agent is corresponds to

$$H = (1-\alpha)^{-1}\left[\left(cC^{-\gamma}\right)^{1-\alpha} - 1\right] + \lambda\left[(1-\tau_k) r k_d + (1-\tau_k^*) r^* k_d^* - c - \dot{k}_d - \dot{k}_d^*\right];$$

where λ is the current value costate variable. The necessary optimality conditions for the home country are then equal to the following expressions

$$\left(cC^{-\gamma}\right)^{-\alpha} \cdot C^{-\gamma} = \lambda; \tag{3a}$$

$$(1-\tau_k) r = (1-\tau_k^*) r^* = \beta - \frac{\dot{\lambda}}{\lambda}; \tag{3b}$$

with the transversality conditions for this problem given by: $\lim_{t\to\infty} \lambda k_d e^{-\beta t} = \lim_{t\to\infty} \lambda k_d^* e^{-\beta t} = 0$. For the foreign economy the corresponding the necessary conditions are given by

$$\left[c^*(C^*)^{-\gamma^*}\right]^{-\alpha^*} \cdot (C^*)^{-\gamma^*} = \lambda^*; \tag{3a$'$}$$

$$(1-\tau_k) r = (1-\tau_k^*) r^* = \beta - \frac{\dot{\lambda}^*}{\lambda^*}; \tag{3b$'$}$$

where λ^* is the current costate variable of the foreign country, with the foreign transversality conditions equal to: $\lim_{t\to\infty} \lambda^* k_f e^{-\beta t} = \lim_{t\to\infty} \lambda^* k_f^* e^{-\beta t} = 0$. Equations (3a, 3a$'$) describe the first order conditions for domestic and foreign own consumption, while (3b, 3b$'$) imply that the after-tax rates of return of domestic and foreign capital held in both countries are equal and correspond, in turn, to the rates of return of consumption at home $\left[\beta - \dot{\lambda}/\lambda\right]$ and abroad $\left[\beta - \dot{\lambda}^*/\lambda^*\right]$.

2.1. The Symmetric Two-Country Equilibrium

To derive the equilibrium conditions, we must first describe production in the world economy. Output y in the domestic economy (y^* represents foreign output) depends on physical capital k and is described by the following standard, neoclassical function

$$y = f(k); \quad f'(k) > 0; \quad f''(k) < 0; \quad f(0) = 0; \quad f(k) \to \infty \quad \text{as} \quad k \to \infty;$$

where we also assume that the relevant Inada conditions hold. In this context, the profit-maximizing conditions for firms at home and abroad are given by:

$$F_k(k) = r; \qquad F_k^*(k^*) = r^*. \tag{4a}$$

Consequently, the conditions (3a, 3a$'$) can be written as:

$$(1 - \tau_k) F_k(k) = (1 - \tau_k^*) F_k^*(k^*). \tag{4b}$$

These relationships emphasize the fact that the rate of return equality for physical capital domiciled at home and abroad is independent of ownership. Since capital can, nevertheless, be owned by residents of either country, the following ownership identities hold:

$$k_d + k_f = k; \qquad k_d^* + k_f^* = k^*.$$

Turning to the consumption sector, we specify a symmetric equilibrium in which the individual and average levels of consumption are identical in both countries, although, in general, not to each other. This implies:

$$c = C; \qquad c^* = C^*.$$

The first-order conditions (3a, 3a$'$) then equal:

$$c^{-[\gamma + \alpha(1-\gamma)]} = \lambda; \tag{5a}$$

$$(c^*)^{-[\gamma^* + \alpha^*(1-\gamma^*)]} = \lambda^*. \tag{5b}$$

Since the rate of return conditions (3b, 3b$'$) imply that the growth rates of the two costate variables are equal, i.e., $\dot{\lambda}/\lambda = \dot{\lambda}^*/\lambda^*$, the levels of λ and λ^* are then related according to

$$\lambda^* = \pi\lambda; \tag{6a}$$

where π is a constant of proportionality that will be determined from the steady-state equilibrium derived below. Using (5a, b) and (6a), the corresponding relationship between

c and c^* is given by:

$$(c^*)^{-[\gamma^*+\alpha^*(1-\gamma^*)]} = \eta c^{-[\gamma+\alpha(1-\gamma)]}. \tag{6b}$$

To calculate the Euler equations for the home and foreign country, we take time the time derivatives of (5a, b), divide respectively by (5a, 5b), and use (3b, 3b$'$) and (4b) to obtain

$$\dot{c} = \sigma c[(1-\tau_k)F_k(k) - \beta]; \tag{7a}$$

$$\dot{c}^* = \sigma^* c^*[(1-\tau_k^*)F_k^*(k^*) - \beta]; \tag{7b}$$

where the parameters

$$\sigma = [\gamma + \alpha(1-\gamma)]^{-1}; \qquad \sigma^* = [\gamma^* + \alpha^*(1-\gamma^*)]^{-1}; \tag{7c}$$

are, respectively, elasticities of intertemporal substitution for the domestic and foreign country. Clearly, since the after-tax rates of return of domestic and foreign capital are equal, the Euler equations are related according to $\dot{c}^* = (\sigma c/\sigma^* c^*)\dot{c}$. As discussed in Fisher and Hof (2000), the relationship between the elasticities of intertemporal substitution $(\sigma; \sigma^*)$ and the status parameters $(\gamma; \gamma^*)$ is ambiguous and depends, in turn, on the preference parameters $(\alpha; \alpha^*)$.[4] In particular, if $\alpha > 1$ (resp. $\alpha^* > 1$), then σ (resp. σ^*) will depend positively on the status parameter γ, while if $\alpha < 1$ (resp. $\alpha^* < 1$), then σ (resp. σ^*) will depend negatively on the status parameter γ (resp. γ^*).[5] If we assume, as we do in our simulation analysis in section 3, that $\alpha = \alpha^*$, then the two elasticities of intertemporal substitution will differ if and only if the status parameters at home and abroad, $(\gamma; \gamma^*)$, differ. Consequently, different attitudes toward status in the two economies will be "observed" as different values of the intertemporal elasticity of substitution in this model.

Turning to the public sectors at home and abroad, we assume that government expen-

[4] In the absence of status preference [$\gamma \equiv 0$ (resp. $\gamma^* \equiv 0$)], the intertemporal elasticity of substitution equals α^{-1} (resp. $(\alpha^*)^{-1}$) in the domestic (resp. foreign) economy.

[5] In Fisher and Hof (2000), the elasticity of substitution of the decentralized economy is referred to as the effective decentralized elasticity of substitution in order to distinguish it from the elasticity of substitution derived in the social optimum. Since we do not make this distinction in this paper, we will refrain from employing their terminology.

ditures g and g^* are funded by source-based capital and lump-sum taxation

$$g = \tau_k F_k(k)\,k + T, \tag{8a}$$

$$g^* = \tau_k^* F_k^*(k^*)\,k^* + T^*, \tag{8b}$$

Observe that we have abstracted from public sector debt in this balanced-budget formulation.

We assume that world goods market equilibrium always holds, which implies that output in the two countries equals the domestic and foreign aggregate of private consumption, physical investment, and public expenditure:

$$F(k) + F^*(k^*) = c + c^* + \dot{k} + \dot{k}^* + g + g^*. \tag{9}$$

Furthermore, the levels of wealth in the domestic and foreign economies equal

$$W = k_d + k_d^*; \qquad W^* = k_f + k_f^*;$$

which implies that the stock of world wealth is simply the sum of the stocks of physical capital domiciled at home and abroad:

$$W + W^* = k + k^*.$$

In turn, the net asset holdings of the domestic economy is denoted by N and equals the difference between the domestic holdings of foreign capital and the corresponding foreign holdings of domestic capital:

$$N = k_d^* - k_f. \tag{10}$$

Consequently, total domestic wealth is given by $W = k + N$, while that in the foreign country equals $W^* = k^* + N^*$. To derive the expression for the domestic current account balance ($\equiv \dot{N}$), we take the time derivative of (10) and substitute into the resulting expression: (i) the flow budget constraint (1b) of the domestic household and (ii) the domestic and foreign government budget constraints (8a)-(8b). After using the optimality conditions in (4a) for domestic and foreign firms, the identity $k_d^* = N + k_f$, and the rate of return equality condition (4b), we obtain the following expression for $\dot N$:

$$\dot N = F(k) - c - g - \dot k + (1-\tau_k)F_k(k)k. \tag{11}$$

The accumulation of net foreign assets — proceeding from initial values N_0 and k_0 — depends on the difference between domestic output plus after-tax net interest income and domestic absorption, which equals the sum of domestic consumption, physical investment, and government expenditure. In addition, we impose the following solvency condition on the accumulation of international assets: $\lim_{t\to\infty} N \exp[-\int_0^t (1-\tau_k)F_k(k(s))ds] = 0$.

2.2. The Dynamics of the World Economy

Taking the time derivative of the rate of return condition (4b), we obtain, after re-arranging, the following expression governing the relationship between $\dot k$ and $\dot k^*$:

$$\dot k^* = \frac{(1-\tau_k)F_{kk}(k)}{\left(1-\tau_k^*\right)F_{kk}^*(k^*)}\dot k. \tag{12a}$$

Substituting (12a) into the world market-clearing condition yields, after re-arranging, the following differential equation $\dot k$ in the domestic capital stock:

$$\dot k = \frac{\left(1-\tau_k^*\right)F_{kk}^*(k^*)}{\left(1-\tau_k^*\right)F_{kk}^*(k^*) + (1-\tau_k)F_{kk}(k)}\left[F(k) + F^*(k^*) - c - c^* - g - g^*\right]. \tag{12b}$$

Since the paths of k^* and c^* can be expressed in terms of their domestic counterparts, the independent dynamics of the world economy consists of equations (7a), (12b), together with the transversality and initial conditions. Linearizing (7a) and (12b) about the steady-state equilibrium [see below the system of equations (18a)-(18d)], using (4b), (6b), and substituting for steady-state world market clearing (18b), we obtain the following matrix differential equation for the domestic capital stock and consumption

$$\begin{pmatrix} \dot k \\ \dot c \end{pmatrix} = \begin{pmatrix} a_{11} & a_{12} \\ a_{21} & 0 \end{pmatrix} \begin{pmatrix} k - \tilde k \\ c - \tilde c \end{pmatrix}; \tag{13a}$$

where

$$a_{11} = \frac{(1-\tau_k^*)F_{kk}^*(\bar{k}^*)F_k\left(\bar{k}\right) + (1-\tau_k)F_{kk}(\bar{k})F_k^*\left(\bar{k}\right)}{\left[1-\tau_k^*\right]F_{kk}^*\left(\bar{k}^*\right) + (1-\tau_k)F_{kk}(\bar{k})} > 0,$$

$$a_{12} = -\frac{(1-\tau_k^*)F_{kk}^*(\bar{k}^*)}{\left[1-\tau_k^*\right]F_{kk}^*\left(\bar{k}^*\right) + (1-\tau_k)F_{kk}(\bar{k})}\left[\frac{(\sigma-\sigma^*)\bar{c} + \sigma^*\left[F\left(\bar{k}\right) + F^*\left(\bar{k}^*\right) - g - g^*\right]}{\sigma\bar{c}}\right] < 0,$$

$$a_{21} = \sigma\bar{c}(1-\tau_k)F_{kk}\left(\bar{k}\right) < 0, \tag{13b}$$

and where $\left(\bar{k}, \bar{k}^*, \bar{c}, \bar{c}^*\right)$ denote, respectively, the steady-state values of home and foreign physical capital and consumption.[6] The stability properties of dynamic system described by (13a) depend on the properties of its characteristic polynomial, which is given by

$$0 = -(a_{11}-\mu)\mu - a_{12}a_{21} = \mu^2 - [\mathrm{tr}(J)]\mu + \det(J), \tag{14a}$$

where the trace and determinant of the Jacobian matrix J of (13a) equal:

$$\mathrm{tr}(J) = a_{11} > 0, \qquad \det(J) = -a_{12}a_{21} < 0. \tag{14b}$$

The eigenvalues of J satisfy $\mathrm{tr}(J) = \mu_1 + \mu_2$, $\det(J) = \mu_1\mu_2$ and are given by

$$\mu = \frac{1}{2}\left[\mathrm{tr}(J) \pm \sqrt{[\mathrm{tr}(J)]^2 + 4|\det(J)|}\right],$$

where $|\det(J)|$ denotes the absolute value of $\det(J)$. For the steady-state equilibrium $(\bar{k}, \bar{c})$ to be a saddlepoint, $\det(J) < 0$, which obtains in this case. Consequently, the Jacobian matrix of (13a) has one negative and one positive eigenvalue such that $\mu_1 < 0$, $\mu_2 > 0$, $|\mu_1| < \mu_2$. Using standard methods, we then obtain the following linearized solution path for domestic capital and the stable saddlepath in (k, c)–space

$$k = \bar{k} - (\bar{k} - k_0)e^{\mu_1 t}, \tag{15a}$$

$$c - \bar{c} = \frac{a_{21}}{\mu_1}(k - \bar{k}) = -\frac{(a_{11}-\mu_1)}{a_{12}}(k - \bar{k}), \tag{15b}$$

[6] The procedure used to derive the elements (a_{11}, a_{12}, a_{21}) of the Jacobian matrix J of (13a) is described in the appendix.

where k adjusts from an exogenous initial stock, k_0. Clearly, the saddlepath associated with the stable (negative) eigenvalue is positively sloped, since $a_{21} < 0$, $\mu_1 < 0$. In the rest of the paper we will term the absolute value of μ_1, $|\mu_1|$, the stable speed of adjustment. We emphasize that this the speed of adjustment is common to both countries and is due to the that fact that physical capital is perfectly mobile internationally.

The next step in characterizing the dynamics of the world economy is to determine the solution for the domestic current account balance (the foreign current account balance is, of course, a mirror image of the domestic). Linearizing (11) about the steady state equilibrium yields

$$\dot{N} = \left[F_k\left(\tilde{k}\right) - \mu_1 + (1-\tau_k^*)F_{kk}\left(\tilde{k}\right)\tilde{N}\right](k-\tilde{k}) - (c-\tilde{c}) + \beta\left(N-\tilde{N}\right)$$

$$= -\left\{F_k\left(\tilde{k}\right) - \mu_1 - \frac{a_{21}}{\mu_1} + (1-\tau_k^*)F_{kk}\left(\tilde{k}\right)\tilde{N}\right\}(\tilde{k}-k_0)e^{\mu_1 t} + \beta\left(N-\tilde{N}\right) \qquad (16a)$$

where we have substituted for (15a, b) in calculating the second equality of (16a). Letting

$$\Phi = \left\{F_k\left(\tilde{k}\right) - \mu_1 - \frac{a_{21}}{\mu_1} + (1-\tau_k^*)F_{kk}\left(\tilde{k}\right)\tilde{N}\right\} \qquad (16b)$$

and integrating (16a) subject to the intertemporal solvency condition, the solution for path of $N(t)$ equals

$$N(t) = \tilde{N} + \frac{\Phi}{\beta-\mu_1}(\tilde{k}-k_0)e^{\mu_1 t}. \qquad (17a)$$

Furthermore, intertemporal solvency also implies the following long-run relationship linking the stock of domestically held assets and domestic physical capital:

$$\tilde{N} - N_0 = -\frac{\Phi}{\beta-\mu_1}(\tilde{k}-k_0) \equiv \Gamma(\tilde{k}-k_0). \qquad (17b)$$

Following Bianconi and Turnovsky (1997), the coefficient $[-\Phi/(\beta-\mu_1)] \equiv \Gamma$ in (17b) determines long-run relationship between international asset and domestic capital accumulation. It is straightforward to show that the coefficient Γ is ambiguous in sign, which reflects the fact that domestic capital accumulation has both a trade-balance effect and a rate of return effect that can have opposing implications for the long-run accumulation of international assets.[7]

We are ready to describe the steady-state equilibrium. It is reached when $\dot{k} = \dot{k}^* = \dot{c} = \dot{c}^* = \dot{N} = 0$ and consists of the following long-run relationships:

$$(1 - \tau_k) F_k\left(\tilde{k}\right) = (1 - \tau_k^*) F_k^*\left(\tilde{k}^*\right) = \beta; \tag{18a}$$

$$F\left(\tilde{k}\right) + F^*\left(\tilde{k}^*\right) - g - g^* = \tilde{c} + \tilde{c}^*; \tag{18b}$$

$$\beta \tilde{N} = \tilde{c} + g - F\left(\tilde{k}\right) = F^*\left(\tilde{k}^*\right) - \tilde{c}^* - g^*; \tag{18c}$$

$$\tilde{N} - N_0 = -\frac{\Omega}{\beta - \mu_1}\left(\tilde{k} - k_0\right). \tag{18d}$$

Equation (18a) is the steady-state arbitrage condition for domestic and foreign capital. It states that the after-tax marginal physical products of domestic and foreign capital equal the common rate of intertemporal time preference β and determine the values of $\tilde{k}$ and $\tilde{k}^*$. Using the equilibrium values of $\tilde{k}$ and $\tilde{k}^*$, the production functions $F(k)$ and $F^*(k^*)$ solve, in turn, for $\tilde{y}$ and $\tilde{y}^*$, steady-state output at home and abroad. Given the exogenous levels of domestic and foreign government spending, the steady-state world market clearing condition (9) and $F(k) + F^*(k^*)$ determine in (18b) the sum of domestic and foreign consumption spending, $\tilde{c} + \tilde{c}^*$. To solve for domestic consumption $\tilde{c}$, we then substitute (18d) into (18c). Observe, in particular, that the stable eigenvalue μ_1 depends, through the element a_{12} of J (13a), on the steady-state value of domestic consumption $\tilde{c}$ and on the difference $(\sigma - \sigma^*)$ between the domestic and foreign intertemporal elasticities of substitution. This implies that the long-run values of $\tilde{c}$ and μ_1 are determined simultaneously in this model in which the two countries have different attitudes toward status. As we will see below, this will not be the case if both countries place an equal weight on status considerations. The stable eigenvalue μ_1 is then independent of $\tilde{c}$, though not of $\tilde{k}$. This result is also in contrast to the closed-economy findings of Fisher and Hof (2000) in which the steady-state level of consumption is independent of status considerations, along with

[7] Since a greater stock of capital increases output and reduces the rate of capital accumulation, it can improve domestic the trade balance, although the accompanying effect of a higher level of consumption tends to offset this. On the other hand, a higher stock of capital reduces the rate of return on international assets in the two-country framework, which tends to deteriorate the current account of the domestic economy.

all other parameters of the constant elasticity instantaneous utility function. Given the solution of $\tilde{c}$, the long-run value of foreign consumption $\tilde{c}^*$ is obtained residually using equation (18c). In turn, the long-run stock of international assets $\tilde{N}$ is calculated by the substituting the solutions for $\tilde{k}$, a_{21}, μ_1, along with the relevant parameter values, into Γ and then using the steady-state current account balance equation (18d). Finally, once $\tilde{c}$ and $\tilde{c}^*$ are determined, we can employ the optimality conditions (5a, b) to solve for $\tilde{\lambda}$ and $\tilde{\lambda}^*$, which also determines the ratio $\tilde{m}$ from (6a) .

3. The Role of Status

3.1. Derivation of the Parameterized Model

In this section of the paper, we will study the effects of differential attitudes toward status preference on the world economic equilibrium. To do so, we will parameterize the production-side of the world economy and use the Gali-Harbough preferences described in (2). First, we will assume that the production functions of the domestic and foreign economies are identical. To maintain the rate of return condition (4b), this requires that capital taxes in both countries are set equal to zero. In addition, we will assume that the levels of government expenditure at home and abroad are identical, $g = g^*$. To focus on the influence of status preference, we will assume that both countries possess the following Cobb-Douglas production function

$$y = Ak^{\alpha}; \qquad A > 0; \quad 0 < \alpha < 1 \tag{19}$$

where A denotes the level of total factor productivity. Using the steady-state optimality condition (18a) and world market clearing (18b), this specification implies that the long-run values of the domestic and foreign capital stocks and outputs, along with the sum of domestic and foreign consumption equal:

$$\tilde{k} = \tilde{k}^* = \left(\frac{\beta}{\alpha A}\right)^{1/(\alpha-1)}; \qquad \tilde{y} = \tilde{y}^* = A\left(\frac{\beta}{\alpha A}\right)^{\alpha/(\alpha-1)}; \tag{20a}$$

$$\tilde{c} + \tilde{c}^* = 2\left[A\left(\frac{\beta}{\alpha A}\right)^{\alpha/(\alpha-1)} - g\right]. \tag{20b}$$

As discussed in the previous section, the values of μ_1 and $\tilde{c}$ — given the solutions for $\tilde{k}$ and $\tilde{y}$ in (20a, 20b) — are determined simultaneously using the steady-state relationships (18c) and (18d). To obtain these solutions, we must derive the parameterized expressions for $(a_{11}; a_{12}; a_{21})$ stated in (13b). Using (13b), the steady-state Euler relationship (18a), the production function (19), and our assumptions about fiscal policy, the parameterized elements $(a_{11}; a_{12}; a_{21})$ of J correspond to:

$$a_{11} = \beta > 0; \qquad a_{12} = -\frac{1}{2\sigma}\left\{(\sigma - \sigma^*) + (2\sigma^*/\tilde{c})\left[A\tilde{k}^{\eta} - g\right]\right\} < 0;$$

$$a_{21} = -\sigma\tilde{c}(1-\eta)\eta A\tilde{k}^{\eta-2} < 0. \qquad (13b')$$

The expressions imply, in turn, that $\mathrm{tr}(J)$ and $\det(J)$ become:

$$\mathrm{tr}(J) = \mu_1 + \mu_2 = a_{11} = \beta;$$

$$\det(J) = \mu_1\mu_2 = -a_{12}a_{21} = -\frac{(1-\eta)\eta A\tilde{k}^{\eta-2}}{2}\left\{(\sigma-\sigma^*)\tilde{c} + 2\sigma^*\left[A\tilde{k}^{\eta} - g\right]\right\}. \qquad (14b')$$

Consequently, while $\mathrm{tr}(J)$ equals the exogenous rate of intertemporal time preference β, $\det(J)$ depends on the difference between the domestic and foreign elasticities of intertemporal substitution $(\sigma - \sigma^*)$, in addition to the (steady-state) curvature of the production function and the level of world output net of domestic and foreign government expenditure. Using the parameterized expressions (13b$'$, 14b$'$) for $\mathrm{tr}(J)$ and $\det(J)$, the equation for the stable eigenvalue μ_1 equals:

$$\mu_1 = \frac{1}{2}\left\{\mathrm{tr}(J) - \sqrt{[\mathrm{tr}(J)]^2 + 4|\det(J)|}\right\}$$

$$= \frac{1}{2}\left[\beta - \sqrt{\beta^2 + 2(1-\eta)\eta A\tilde{k}^{\eta-2}\left[(\sigma-\sigma^*)\tilde{c} + 2\sigma^*\left[A\tilde{k}^{\eta} - g\right]\right]}\right]. \qquad (21)$$

Observe that since $\det(J)$ depends on the difference between the domestic and foreign elasticities of intertemporal substitution, $(\sigma - \sigma^*)$, and on the steady-state level of domestic consumption $\tilde{c}$, so does μ_1.

If, instead, the intertemporal elasticities at home and abroad are equal, $\sigma = \sigma^*$, which implies a common attitude toward status in the two countries, the element a_{12} then simplifies to

$$a_{12} = -\frac{\left[A\tilde{k}^{\eta} - g\right]}{\tilde{c}} < 0;$$

so that

$$\det(J) = -a_{12}a_{21} = -\sigma\left[A\tilde{k}^{\eta} - g\right](1-\eta)\eta A\tilde{k}^{\eta-2} < 0;$$

which implies that the eigenvalue μ_1 equals:

$$\mu_1 = \frac{1}{2}\left[\beta - \sqrt{\beta^2 + 4\sigma(1-\eta)\eta A\tilde{k}^{\eta-2}\left[A\tilde{k}^{\eta} - g\right]}\right]: \qquad (21')$$

Examining this latter expression, we see that it is independent of the steady-state domestic consumption, $\tilde{c}$.

Continuing, our parameterization and fiscal policy assumptions imply that the term $-\eta\left[-\Phi/(\beta-\mu_1)\right]$ in equation (16b) becomes

$$-\eta - \frac{\Phi}{\beta-\mu_1} = \frac{\left[\beta-\mu_1-\frac{a_{21}}{\mu_1}+F_{kk}\left(\tilde{k}\right)\tilde{N}\right]}{\beta-\mu_1}: \qquad (16b')$$

Substituting (16b′) into the long-run constraint (18d) governing international asset accumulation and using $F_{kk}\left(\tilde{k}\right) = -(1-\eta)\eta\tilde{k}^{\eta-2}$, we obtain the following expression for $\tilde{N}$:

$$\tilde{N} = \frac{(\beta-\mu_1)N_0}{(\beta-\mu_1)-(1-\eta)\eta A\tilde{k}^{\eta-2}\left(\tilde{k}-k_0\right)} - \frac{(\beta-\mu_1)-a_{21}/\mu_1}{(\beta-\mu_1)-(1-\eta)\eta A\tilde{k}^{\eta-2}\left(\tilde{k}-k_0\right)}\left(\tilde{k}-k_0\right): \qquad (22a)$$

Employing the steady-state current account relationship $\beta\tilde{N} = \tilde{c} - \left[A\tilde{k}^{\eta} - g\right]$ [see equation (18c)], we obtain the equation we will employ to solve for the steady-state level of domestic consumption $\tilde{c}$ in the numerical simulations

$$\frac{\beta(\beta-\mu_1)N_0}{(\beta-\mu_1)-(1-\eta)\eta A\tilde{k}^{\eta-2}\left(\tilde{k}-k_0\right)} - \frac{\beta(\beta-\mu_1)-\beta a_{21}/\mu_1}{(\beta-\mu_1)-(1-\eta)\eta A\tilde{k}^{\eta-2}\left(\tilde{k}-k_0\right)}\left(\tilde{k}-k_0\right)$$

$$= \tilde{c} - \left[A\tilde{k}^{\eta} - g\right] \qquad (22b)$$

where the expressions for a_{21} and μ_1 are given, respectively, in (13b′) and (21). Once the value of $\tilde{c}$ is determined, the remaining steady-state variables are easily obtained employing the procedure outlined in the previous section.

3.2. Numerical Simulation

3.2.1. Benchmark Parameterization

Next, we will conduct a numerical simulation of the two-country world economy in order to analyze the implications of different attitudes toward status at home and abroad. We will consider a benchmark situation in which the two economies are symmetric with respect to their production structures and their public expenditure and tax policies, in accordance with the parameterized model described in the previous subsection. We will make the following assumptions concerning the common production function, levels of government expenditure, the common rate of time preference, and the initial stocks of domestic physical capital and international assets:[8]

$$\eta = 0.36; \quad A = 1; \quad \beta = 0.04; \quad g = g^* = 0.3442; \quad k_0 = 20.974; \quad N_0 = 0. \tag{23a}$$

Using the steady-state relationships (18a, b), these structural parameters imply that the steady-state values of the domestic and foreign capital stocks, outputs, and the sum of domestic and foreign consumption equal:

$$\tilde{k} = \tilde{k}^* = 30.974; \qquad \tilde{y} = \tilde{y}^* = 3.442; \qquad \tilde{c} + \tilde{c}^* = 6.195. \tag{23b}$$

Observe that we assume that domestic and foreign government expenditures both absorb 10% of output.

We will assume two benchmark values of the domestic and foreign elasticities of substitutions. First, we specify a common elasticity of intertemporal substitution of $\sigma = \sigma^* = 0.5$ and fix the values of α and α^* at 0.4, i.e., $\alpha = \alpha^* = 0.4$. The corresponding value of the status parameter in the two countries then equals $\gamma = \gamma^* = 2.667$. Using (21′) and (23a,

[8] Except where indicated, we report the numerical solutions rounded to a thousandth of a decimal point

b), the speed of adjustment $|\mu_1|$ is given by

$$|\mu_1| = 0.021; \tag{23c}$$

where $F_{kk}\left(\tilde{k}\right) = -(1-\alpha)\alpha A\tilde{k}^{\alpha-2} = -0.000826$. Using (23a–c), the expression for a_{21}, and equations (22b) and (18c, d), the steady-state values of domestic and foreign consumption and the domestic stock of international assets are:

$$\tilde{c} = 3.097; \qquad \tilde{c}^{*} = 3.097; \qquad \tilde{N} = 0. \tag{23d}$$

Consequently, in this benchmark equilibrium in which the preferences of two countries are identical, steady-state consumption at home and abroad are identical, which implies, given the fact that output net of government expenditure is the same in the two countries, that steady-state domestic net credit is zero. We can use the benchmark values of $\tilde{c}$ and $\tilde{c}^{*}$ to find the corresponding solutions of the steady-state marginal utilities of wealth, $\tilde{\lambda}$ and $\tilde{\lambda}^{*}$, and the ratio $\tilde{n}$. Using (5a, b) and (6a), these are given by:

$$\tilde{\lambda} = 0.104; \qquad \tilde{\lambda}^{*} = 0.104; \qquad \tilde{n} = 1.0. \tag{23e}$$

Using our solutions for the domestic capital stock and the stable (k, c) saddlepath given in (15a, b), we can next determine the value of initial domestic consumption, $c(0)$. The value of $c(0)$ is calculated by combining equations (15a, b) and substituting for $\tilde{c}$ and μ_1 from (23c, d), along with $a_{21} = -0.0008\sigma\tilde{c}$ and $\left(\tilde{k} - k_0\right) = 10$. Combining the solution for $c(0)$ with $\tilde{n} = 1$ from (23e) yields, using equation (6b), the value of initial foreign consumption, $c^{*}(0)$. Accordingly, initial consumption at home and abroad equals:

$$c(0) = 2.488; \qquad c^{*}(0) = 2.488$$

As in the case of steady-state consumption, initial consumption in the two economies is also identical in the benchmark case.

The second benchmark preference parameter values we specify correspond to $\sigma =$

$\sigma^* = 1.5$, where $\alpha^* = \alpha = 1.2$.[9] As in the previous example, this implies that the status parameter at home and abroad equals $\gamma^* = \gamma = 2.667$. In this case, the value of the speed of adjustment is:

$$|\mu_1| = 0.045. \tag{24a}$$

Employing (23a, b) and (24a), the expression for a_{21}, and (22b) and (18c, d), the values of $\tilde{e}$, $\tilde{e}^*$, and $\tilde{N}$ for this alternative benchmark case correspond to:

$$\tilde{e} = 3.097; \qquad \tilde{e}^* = 3.097; \qquad \tilde{N} = 0.0. \tag{26e}$$

Comparing the two benchmark cases, while $\tilde{e}$, $\tilde{e}^*$, and $\tilde{N}$ are identical, the speed of stable adjustment is higher (0.045 vs 0.021) if the elasticities of intertemporal substitution equal 1.5 rather than 0.5. In addition, the steady-state marginal utilities of wealth are higher if $\sigma = \sigma^* = 1.5$ rather than $\sigma = \sigma^* = 0.5$, although, of course, $\tilde{m}$ in this case still equals unity:

$$\tilde{\lambda} = 0.471; \qquad \tilde{\lambda}^* = 0.471; \qquad \tilde{m} = 1.0.$$

A final distinction between the two cases is that initial consumption at home and abroad is lower if $\sigma = \sigma^* = 1.5$ rather than $\sigma = \sigma^* = 0.5$, a result that is consistent with the higher speed of adjustment in the second benchmark case. Following the procedure outlined above, initial consumption in the two economies is the same and equal to:

$$c(0) = 2.246; \qquad c^*(0) = 2.246.$$

3.2.2. Divergent Attitudes toward Status

We now analyze the implications of the two countries having divergent attitudes toward status, i.e., the case in which status parameters γ and γ^* differ. We will illustrate these results in tables that correspond to the two benchmark parameter values. Tables 1a, 1b, and 3a assume that the foreign status preference parameter γ^* is fixed at 2.667 ($\sigma^* = 0.5$) and allow the domestic status preference parameter γ to range between 1.0 and 16.0 (σ

[9] The available empirical evidence supports a value of the intertemporal elasticity of substitution closer to 0.5 than to 1.5.

ranges between 0.1 and 1.0). In both countries $\alpha = \alpha^* = 0.4$. In contrast, Tables 2a, 2b, and 3b hold the value of σ^* constant at 1.5 (with $\gamma^* = 2.667$, $\alpha = \alpha^* = 1.2$) and permit the domestic status parameter γ to vary between 1.453 and 3.5 (σ ranges between 1.1 and 2.0). Observe that the benchmark solutions given above are repeated in bold type in fifth rows of Tables 1, 2, and 3, respectively. As indicated, we substitute the parameterized expressions for a_{21} and μ_1 from equations (13b$'$) and (21) into (22b) and (18c, d) to obtain — given the benchmark results in equations (23a, b) — the entries for $\tilde{c}$, $\tilde{c}^*$, and $\tilde{N}$ in Tables 1a and 2a. The implied values of speed of adjustment $|\mu_1|$ are listed in the final columns of Tables 3a and 3b. The results stated in Tables 1b and 2b give the steady-state values of the domestic and foreign marginal utilities, $\tilde{\lambda}$ and $\tilde{\lambda}^*$, along with the corresponding steady-state ratios $\tilde{m}$. The latter are calculated by substituting the steady-state solutions for $\tilde{c}$ and $\tilde{c}^*$ from Tables 1a and 2a into (5a, b) and then substituting the resulting expressions into (6a) to solve for $\tilde{m}$ for the two status preference scenarios we consider. Finally, Tables 3a and 3b contain the values of initial consumption at home and abroad. For the two cases we employ the solutions (15a,b), and substitute for the values of $\tilde{c}$, μ_1, $a_{21} = -0.0008\sigma\tilde{c}$, along with $\left(\tilde{k} - k_0\right) = 10$, to obtain corresponding expression for $c(0)$. Substituting the resulting solutions of $c(0)$, together with the values of $\tilde{m}$ from Tables 1b and 2b, into (6b) yields the values of $c^*(0)$.

What are the effects of permitting the two countries to differ with regard to status preference? Moving up the rows of Tables 1a and 1b corresponds to higher values of the domestic status parameter γ and lower values of the domestic elasticity of intertemporal substitution σ, which is consistent with $\alpha < 1$. In this case we find that higher values of the domestic status parameter lead to lower levels of steady-state domestic consumption $\tilde{c}$. Accordingly, domestic holdings $\tilde{N}$ of international assets fall when the domestic status parameter increases. In consequence — since the foreign economy becomes a greater steady-state net creditor as γ rises — steady-state foreign consumption $\tilde{c}^*$ increases moving up the rows in Table 1a. Furthermore, as illustrated in the last column of Table 3a, the speed stable adjustment $|\mu_1|$ declines from 0.029 to 0.015 as γ ranges from 1.0 to 16.0. The results of Table 1a are also reflected in Table 1b, which illustrates the fall in the steady-state domestic marginal utility $\tilde{\lambda}$ as the domestic status parameter γ rises relative to its foreign counterpart γ^*.[10] Equally, the resulting higher values of steady-state foreign consumption $\tilde{c}^*$ — if γ increases relative to γ^* — lead to lower levels of the steady-state foreign marginal utility $\tilde{\lambda}^*$ and to greater values of $\tilde{m}$, as reported in Table 1b.

We turn next to Tables 2a and 2b, which depict the case in which the elasticity of substitution abroad, σ^*, is fixed at 1.5, while that of the domestic country, σ, ranges between 1.1 and 2.0. In contrast to Table 1a, the value of the domestic status parameter γ falls as we move up Table 2a and implies, consistent with $\alpha > 1$, lower values of the domestic elasticity of intertemporal substitution σ. According to the results illustrated in Table 2a, a greater domestic weight placed on status relative to the benchmark case means — unlike in Table 1a — a higher value of steady-state domestic consumption. Consistent with the steady-state current account relationship (18c), this is associated with an increase in steady-state domestic credit ($\tilde{b} > 0$) and lower values of foreign steady-state consumption $\tilde{c}^*$. In addition, the last column of Table 3b shows that the rate of stable adjustment $|\mu_1|$ rises from 0.041 to 0.050 as γ ranges from 1.453 to 3.5. Finally, Table 2b illustrates the values for $\tilde{\lambda}$, $\tilde{\lambda}^*$, $\tilde{m}$ that result from our calculations in Table 2a. Here, the domestic marginal utility $\tilde{\lambda}$ and $\tilde{\lambda}^*$ both increase as γ rises relative to γ^*. Since $\tilde{\lambda}$ rises more than $\tilde{\lambda}^*$ as γ increases relative its benchmark value, $\tilde{m}$ falls below unity in this case.

Comparing Tables 1 and 2, what regularities can we find? Recall that the status parameter in this model has an ambiguous relationship with respect to the intertemporal elasticity of substitution and, hence, with respect to steady-state consumption at home and abroad. Nevertheless, the relative relationship between the domestic and foreign elasticities of intertemporal substitution has an unambiguous impact on international distribution of steady-state consumption. In other words, our results in Tables 1 and 2 show that if a change in domestic status preference γ lowers [resp. increases] σ relative to σ^*, then domestic steady-state consumption $\tilde{c}$ falls [resp. rises] relative to foreign steady-state consumption $\tilde{c}^*$.

To shed additional light on the role played by status preference in determining the international economic equilibrium, we finally consider the effects that different values of γ have on initial consumption at home and abroad, $c(0)$ and $c^*(0)$. These are given in Tables

[10] Although the decline in $\tilde{c}$ tends to raise $\tilde{\lambda}$, the corresponding fall in σ [see (5a)] has a stronger negative effect on $\tilde{\lambda}$. Thus, the steady-state domestic marginal utility declines for higher values of γ in Table 1b.

3a and 3b for the two status preference cases under consideration. In Table 3a, the higher is γ relative to γ^* (equally, the lower is σ relative to σ^*), the higher is the corresponding value of initial domestic consumption $c(0)$ compared to its foreign counterpart, $c^*(0)$. Comparing the results of Tables 1a and 3a, it is straightforward to show, moreover, that the difference between the initial and steady-state values of domestic consumption shrinks the higher is γ (and the lower is σ). Table 3b, the counterpart of Table 2b, shows, in contrast, that the initial value of domestic consumption is lower with as γ rises relative to γ^*. These results reflect, as before, the ambiguous relationship between status preference and the elasticity of intertemporal substitution. Nevertheless, a change in the domestic economy's attitude toward status that lowers [resp. increases] σ relative to σ^*, increases [resp. falls] $c(0)$ relative to $c^*(0)$.

4. Concluding Remarks and Extensions

In this paper we analyzed the role of status preference in a decentralized, two-country world economy with representative agents. We specified that status preference depends on the average level of consumption (in the agent's own country) and investigated the implications of different attitudes toward status. But rather than reiterating results just given, we will briefly discuss future work. Since the two-country framework employed in this paper is still relatively simple, many relevant extensions are possible. An obvious one is to allow agents at home and abroad to choose a level of work effort. If agents' status preferences also depend on average consumption, as they did here, then labor supply will also be a function of agents' attitude toward status. This, however, implies that the domestic and foreign capital stocks and levels of output will also depend on the degree of status preference in the two countries. This was not the case the present model in which the steady state of the production-side of the economy was independent of the parameters of the instantaneous utility function, including the status preference parameter. Thus, permitting an endogenous employment decision in our framework opens up new channels through which status preference can influence the intertemporal dynamics of the open economy. This extension is one we will pursue in future research.

5. Appendix

5.1. The Derivation of a_{11} and a_{12} in (13b)

In this appendix we will show how the linearized expressions for $\dot{k}$ and $\dot{c}$ in terms of $\left(k - \tilde{k}\right)$ and $(c - \tilde{c})$ are derived. Linearizing (12b) about the steady state equilibrium, we obtain:

$$\dot{k} = \frac{(1-\tau_k^*)\,F_{kk}^*(\tilde{k}^*)}{\left[1-\tau_k^*\right] F_{kk}^*\left(\tilde{k}^*\right) + (1-\tau_k)\,F_{kk}(\tilde{k})}$$

$$\times \left[F_k\left(\tilde{k}\right)\left(k - \tilde{k}\right) + F_k^*\left(\tilde{k}^*\right)\left(k^* - \tilde{k}^*\right) - (c - \tilde{c}) - (c^* - \tilde{c}^*)\right]. \tag{A1}$$

First, we will substitute for $\left(k^* - \tilde{k}^*\right)$ in terms of $\left(k - \tilde{k}\right)$ in (A1). Using (4b), it is straightforward to show:

$$\left(k^* - \tilde{k}^*\right) = \frac{(1-\tau_k)\,F_{kk}(\tilde{k})}{\left[1-\tau_k^*\right] F_{kk}^*\left(\tilde{k}^*\right)}\left(k - \tilde{k}\right). \tag{A2}$$

Similarly, the condition (6b) implies the following relationship between $(c^* - \tilde{c}^*)$ and $(c - \tilde{c})$

$$(c^* - \tilde{c}^*) = \frac{\tilde{m}\sigma^*\,(\tilde{c}^*)^{(1+\sigma^*)/\sigma^*}}{\sigma\tilde{c}^{(1+\sigma)/\sigma}}\,(c - \tilde{c})\,; \tag{A3}$$

where we have substituted for the domestic and foreign intertemporal elasticities of substitution, σ and σ^*. To eliminate c^* from the previous expression, we use the relationship $\tilde{c}^* = \tilde{m}^{-\sigma^*}\,(\tilde{c})^{\sigma^*/\sigma}$ from (6b) and substitute into (A3) to obtain:

$$(c^* - \tilde{c}^*) = \frac{\tilde{m}^{-\sigma^*}\sigma^*\tilde{c}^{(\sigma^*-\sigma)/\sigma}}{\sigma}\,(c - \tilde{c}). \tag{A4}$$

Next, to eliminate $\tilde{m}$, we substitute the steady-state world market clearing condition (18b)

$$\tilde{c}^* = \left[F\left(\tilde{k}\right) + F^*\left(\tilde{k}^*\right) - g - g^*\right] - \tilde{c}$$

into $\tilde{c} = \tilde{m}^{\sigma^*}\,(\tilde{c}^*)^{\sigma/\sigma^*}$ to yield the following relationship for $\tilde{m}$ in terms of $\tilde{c}$:

$$\tilde{m} = \frac{\tilde{c}^{1/\sigma}}{\left[F\left(\tilde{k}\right) + F^*\left(\tilde{k}^*\right) - g - g^*\right]_{1/\sigma}}. \tag{A5}$$

Consequently, substituting (A5) into (A4), we show that the relationship between $(c^* - \tilde{c}^*)$ and $(c - \tilde{c})$ becomes

$$(c^* - \tilde{c}^*) = \frac{(\sigma - \sigma^*)\tilde{c} + \sigma^*\left[F\left(\tilde{k}\right) + F^*\left(\tilde{k}^*\right) - g - g^*\right]}{\sigma\tilde{c}}(c - \tilde{c}). \qquad \text{(A6)}$$

Finally, substituting (A2) and (A6) and into (A1), we obtain the following linearized expression of in terms of $\left(k - \tilde{k}\right)$ and $(c - \tilde{c})$

$$\dot{k} = a_{11}\left(k - \tilde{k}\right) + a_{12}(c - \tilde{c}); \qquad \text{(A7)}$$

where the elements a_{11} and a_{12} of J equal:

$$a_{11} = \frac{(1 - \tau_k^*)F_{kk}^*(\tilde{k}^*)F_k\left(\tilde{k}\right) + (1 - \tau_k)F_{kk}(\tilde{k})F_k^*\left(\tilde{k}^*\right)}{\left(1 - \tau_k^*\right)F_{kk}^*\left(\tilde{k}^*\right) + (1 - \tau_k)F_{kk}(\tilde{k})} > 0;$$

$$a_{12} = -\left[\frac{(1 - \tau_k^*)F_{kk}^*(\tilde{k}^*)}{\left(1 - \tau_k^*\right)F_{kk}^*\left(\tilde{k}^*\right) + (1 - \tau_k)F_{kk}(\tilde{k})}\right]\left[\frac{(\sigma - \sigma^*)\tilde{c} + \sigma^*\left[F\left(\tilde{k}\right) + F^*\left(\tilde{k}^*\right) - g - g^*\right]}{\sigma\tilde{c}}\right] < 0.$$

Linearizing (7a) about the steady state, the corresponding expression for $\dot{c}$ appearing in (13) corresponds to $\dot{c} = \sigma\tilde{c}(1 - \tau_k)F_{kk}\left(\tilde{k}\right)\left(k - \tilde{k}\right) = a_{21}\left(k - \tilde{k}\right)$, $a_{21} < 0$.

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Table 1a

Status Preference	e-	e¤	N
° = 16:00 (¾ = 0:1)	2:757	3:438	¡ 8:515
° = 7:667 (¾ = 0:2)	2:869	3:326	¡ 5:704
° = 4:889 (¾ = 0:3)	2:962	3:233	¡ 3:390
° = 3:500 (¾ = 0:4)	3:037	3:158	¡ 1:514
° = 2:667 (¾ = 0:5)	3:097	3:097	0:0
° = 2:111 (¾ = 0:6)	3:147	3:048	1:228
° = 1:714 (¾ = 0:7)	3:187	3:008	2:234
° = 1:417 (¾ = 0:8)	3:220	2:975	3:065
° = 1:185 (¾ = 0:9)	3:248	2:945	3:765
° = 1:000 (¾ = 1:0)	3:271	2:924	4:347

Table 1b

Status Preference	~¸	~¸¤	m
° = 16:00 (¾ = 0:1)	0:00004	0:085	2145:4
° = 7:667 (¾ = 0:2)	0:005	0:090	17:58
° = 4:889 (¾ = 0:3)	0:027	0:096	3:570
° = 3:500 (¾ = 0:4)	0:062	0:100	1:612
° = 2:667 (¾ = 0:5)	0:104	0:104	1:0
° = 2:111 (¾ = 0:6)	0:148	0:108	0:727
° = 1:714 (¾ = 0:7)	0:191	0:111	0:579
° = 1:417 (¾ = 0:8)	0:232	0:113	0:487
° = 1:185 (¾ = 0:9)	0:270	0:115	0:427
° = 1:000 (¾ = 1:0)	0:306	0:117	0:383

Table 1a illustrates the steady-state value of e, e¤, and N for the ¯rst benchmark case in which ¾¤ = 0:5, ® = ®¤ = 0:4, °¤ = 2:667 and given the structural parameters and steady-state solutions in (23a, b), respectively. Table 1b, in turn, states, the corresponding values for ~¸, ~¸¤, and m.

Table 2a

Status Preference	e̴	e̴¤	N̴
° = 1:453 (¾ = 1:1)	3:018	3:177	¡ 1:991
° = 1:833 (¾ = 1:2)	3:040	3:155	¡ 1:439
° = 2:154 (¾ = 1:3)	3:060	3:134	¡ 0:924
° = 2:429 (¾ = 1:4)	3:080	3:115	¡ 0:446
° = 2:667 (¾ = 1:5)	3:097	3:097	0:0
° = 2:875 (¾ = 1:6)	3:114	3:081	0:416
° = 3:059 (¾ = 1:7)	3:130	3:065	0:805
° = 3:222 (¾ = 1:8)	3:144	3:051	1:168
° = 3:368 (¾ = 1:9)	3:158	3:037	1:508
° = 3:500 (¾ = 2:0)	3:171	3:024	1:827

Table 2b

Status Preference	~¸	~¸¤	m̵h
° = 1:453 (¾ = 1:1)	0:366	0:463	1:263
° = 1:833 (¾ = 1:2)	0:396	0:465	1:174
° = 2:154 (¾ = 1:3)	0:423	0:467	1:104
° = 2:429 (¾ = 1:4)	0:448	0:469	1:047
° = 2:667 (¾ = 1:5)	0:471	0:471	1:0
° = 2:875 (¾ = 1:6)	0:492	0:472	0:961
° = 3:059 (¾ = 1:7)	0:511	0:517	0:927
° = 3:222 (¾ = 1:8)	0:510	0:475	0:933
° = 3:368 (¾ = 1:9)	0:546	0:477	0:873
° = 3:500 (¾ = 2:0)	0:562	0:478	0:851

Table 2a illustrates the steady-state values of e̴, e̴¤, and N̴ for the second benchmark case in which ¾¤ = 1:5, ® = ®¤ = 1:2, °¤ = 2:667 and given the structural parameter values and steady-state solutions in (23a, b), respectively. Table 2b, in turn, states the implied values for ~¸, ~¸¤, and m̵h for this case.

Table 3a

Status Preference	c(0)	c¤(0)	j¹1j
° = 16:00 (¾ = 0:1)	2:605	2:589	0:015
° = 7:667 (¾ = 0:2)	2:580	2:550	0:016
° = 4:889 (¾ = 0:3)	2:551	2:521	0:018
° = 3:500 (¾ = 0:4)	2:520	2:501	0:019
° = 2:667 (¾ = 0:5)	2:488	2:488	0:021
° = 2:111 (¾ = 0:6)	2:455	2:478	0:023
° = 1:714 (¾ = 0:7)	2:421	2:472	0:024
° = 1:417 (¾ = 0:8)	2:388	2:468	0:026
° = 1:185 (¾ = 0:9)	2:356	2:464	0:027
° = 1:000 (¾ = 1:0)	2:324	2:350	0:029

Table 3b

Status Preference	c(0)	c¤(0)	j¹1j
° = 1:453 (¾ = 1:1)	2:351	2:261	0:041
° = 1:833 (¾ = 1:2)	2:265	2:184	0:042
° = 2:154 (¾ = 1:3)	2:298	2:252	0:043
° = 2:429 (¾ = 1:4)	2:272	2:249	0:044
° = 2:667 (¾ = 1:5)	2:246	2:246	0:045
° = 2:875 (¾ = 1:6)	2:221	2:244	0:046
° = 3:059 (¾ = 1:7)	2:196	2:242	0:047
° = 3:222 (¾ = 1:8)	2:171	2:118	0:048
° = 3:368 (¾ = 1:9)	2:146	2:239	0:049
° = 3:500 (¾ = 2:0)	2:122	2:238	0:050

Table 3a displays the solutions for the values of initial consumption, c(0) and c¤(0), at home and abroad, together with speed of stable adjustment j¹1j, for the ¯rst benchmark case [¾¤ = 0:5, ® = ®¤ = 0:4, °¤ = 2:667], while Table 3b illustrates the expressions c(0), c¤(0), and j¹1j for the second benchmark case [¾¤ = 1:5, ® = ®¤ = 1:2, °¤ = 2:667].