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# **The Economic Value of A Passport: A Model of Citizenship and the Social Dividend in a Global Economy**

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*In a world of fully mobile capital and highly immobile labour, citizenship is effectively an entitlement to the 'dividend' arising from the social infrastructure accumulated in a particular country of birth. The paper opens with the reasons why the passport (ie citizenship) can in consequence be considered as an economic asset with a value that can in principle be determined analytically. A simple endogenous growth model is set up which defines the level and growth of per capita income in a world economy where capital is fully mobile and labour is fully immobile, and where governments set a rate of taxation such as to achieve the optimal balance between the stocks of private capital and social infrastructure. The 'passport value' is then defined as the difference between national income net of capital charges, wage costs and taxes when divided equally among the population; and is shown to depend on per capita income, the rate of growth and the parameters of the production function. A preliminary estimate of the main variables in the model, and the scale of expenditure on social infrastructure, for a wide range of countries suggests what the order of magnitude of the 'value of a passport' might be. A brief section on the wider implications of the findings concludes.*

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**Introduction**

We live in a world economy where capital can move freely but labour cannot. Moreover, it is intuitively clear that obtaining the citizenship (ie 'passport') of an OECD country endows its owner with level of economic welfare n income greater than that of the citizenship of a non-OECD country, whether 'developing' or 'transitional', even though her labour skills or capital assets equivalent to those of an OECD citizen. The 'economic asset' that citizenship of a democratic industrialized state represents has a value even if it cannot be freely traded; and in fact this citizenship acquired through an accident of birth (or bequeathed to one's children) in most cases probably represents a significant part of the real wealth of the inhabitants of rich countries.

Our purpose in this paper is to define the economic value of a passport as an asset and to explore its determinants both analytically and empirically. The paper has four main sections. In Section 2, we set out the reasons why the passport (ie citizenship) can be considered as an economic asset which reflect a 'social dividend' on infrastructure provision - that is the entitlement to income arising from national income on publicly owned factors of production other than 'pure' labour and capital. A simple endogenous growth model is set up in Section 3 which defines the level and growth of per capita income in a world economy where capital is fully mobile and labour is fully immobile, and where governments set a rate of taxation such as to achieve the optimal balance between the stocks of private capital and public infrastructure. In Section 4 we derive the 'passport value' from the annual 'social dividend', defined as the difference between national income net of capital charges and wage costs, net of taxes and divided equally among the population. This passport value is shown to depend on per capita income, the growth rate and the parameters of the production function. This is then compared with the value of a work permit, and with the marginal cost to existing citizens of permitting an extra immigrant. We attempt in Section 5 to approximate a rough empirical estimate of the size of the 'social dividend' and thus the 'value of a passport' from two directions: the direct estimation of the main parameters in the model, and the scale of expenditure on social infrastructure, for a wide range of countries. Section 6 concludes with a brief discussion of the wider implications of our findings.

**Citizenship as an economic asset**

The emergence of a truly global economy since the end of the Cold War has meant an unprecedented degree of integration through trade and investment, even though labour is as yet free to move only within certain OECD countries (particularly the European Union) and certainly not from the non-OECD economies - whether 'developing' or 'transitional'. The prevailing official view is that globalization presents a unique opportunity for poor economies to catch up through trade and investment as long as they adopt the correct policies - particularly the removal of import barriers and financial liberalization combined with sound macroeconomic policies based on low government expenditure (IMF, 1997). Although some risks are recognized and there is clearly a need for international assistance for the poorer countries (World Bank, 1995), there is every expectation that such integration will lead to a convergence in living standards and thus in a reduction in the pressure to migrate towards richer countries. Against this optimistic picture is set a widespread critical view which suggests that the process of global economic integration may leave a considerable part of humanity worse off and marginalized from dynamic growth centres and without the support of social provision, leading to fragile state structures and even greater migratory pressure (UNRISD, 1995).

The existence of a widespread black market in stolen or forged passports reflects unsatisfied demand from the citizens of poor countries for the citizenship of a richer country. Immigration quotas are severely limited by rich countries, and citizenship can only legally be acquired in practice by prolonged residence, marriage, birth in the territory, the possession of extremely scarce skills, or through persecution in an appropriate rival state. In other words, for the citizens of a rich country their passport in itself represents a considerable economic asset. In marked contrast, citizenship of a poor country can often be obtained officially and at low cost by an immigrant from a rich country.

Specifically, the marginal product of her labour in the richer country can be obtained with a work permit, while income from financial assets does not even require a residence permit. None the less, passports are obviously valued more highly than work or resident permits. This

is because what distinguishes one economy from another in a world of mobile capital is not only the stock of capital and labour skills but also the social infrastructure that is located there as the result of the public investment of fiscal revenue in the past. and the skills and size of the workforce that live there. A passport gives access to this infrastructure on a life-time basis, and includes not only educational and social security benefits, but also full protection by the law, voting rights and so on; in addition to the benefits of a work permit..

Even a work permit has considerable economic value, because moving the same set of skills from a poor to a rich economy raises the worker's productivity and thus wage earnings because her skills are used more effectively due to better economic organization and there is a higher capital stock per worker. etc, this is clearly not the same thing as citizenship, which gives right of abode for a lifetime and guarantees family access to education, health, social security, police protection etc. Ownership of part of the capital stock in a particular country does not in fact even require a residence permit, so the risk-adjusted rate of return is becoming equalised worldwide. What is more, ownership rights are increasingly guaranteed worldwide through international investment conventions. This is not the case for labour, which cannot freely cross boundaries and which works under very different social regimes. In consequence, similar skills receive vastly different rewards according to the citizenship of the worker - due to both her location and her entitlement to a 'dividend' from installed social infrastructure. This would be broadly equivalent to the concept of 'social citizenship' in political theory derived from the rights and obligations in the welfare state as established in industrialized democracies after the Second World War: "the whole range from the right to a modicum of economic welfare and security to the right to share to the full in the social heritage and to live the life of a civilized being according to the standards prevailing in society" (Marshall, 1950: 11).

This issue does not appear to be directly addressed by the modern economic literature on migration, which is derived from a Ricardian model of trade between two countries with mobile labour and two sectors. The traditional result is that pure labour movements (ie without capital or skills) increase (lower) the wage rate of the labour-exporting (labour importing) country. Trade liberalization leads to a rise (fall) of wages in the labour-exporting (-importing) country and thus reduces migration. The introduction of risk and asymmetric information into

this specification makes this formulation more realistic (Stark, 1991), but can generate the result that trade liberalization will actually *increase* migration (Fiani, 1996). None the less, marginal labour productivity changes and thus wage differentials are still the key driving force in the process.

Gatsios et al. (1996) introduce a public good this standard model of trade and migration. into their model; migration affects not only wages due to changes in the labour supply; and changes in the unit net cost of producing the public good. They show that in a labour exporting (labour importing) country, where international migration induces a decrease (increase) in net income tax revenue, the provision of the public good falls (rises) if the unit cost of its production decreases. In the presence of a public good financed by income taxation, however, international migration affects wages also through its impact on the provision of the public good. International migration may lower wages in the source country and raise them in the destination country, regardless of whether it induces an increase or a decrease in the unit cost of the public good. Thus, in the presence of a public good, the existence of a wage differential favouring the destination country, is neither a necessary nor a sufficient condition for migration to be an optimal policy.

They find that under certain conditions international migration may lead to a conflict of interests among workers, non-migrating workers, and the government of a labour-exporting country. Congestion in the consumption of public goods and services, as well as increasing marginal costs, may outweigh the benefits of increased government tax revenue in the host country: “In several industrialised countries (e.g. Germany, France, the UK) anti-migration sentiments unduly view immigrants as a source of poor economic performance (eg rising unemployment and falling wages) and a fiscal burden since, as it is argued, immigrants raise the cost of public goods provision by more than their tax contributions” (*op. cit.* p.15).

In the endogenous growth literature, in contrast, a significant focus has been on the provision of a ‘third’ growth factor other than ‘pure’ labour and capital - variously interpreted as knowledge, institutions, infrastructure, social capital etc. To the extent that this ‘social infrastructure’ is publicly provided and financed out of taxation, as well as probably enjoying

scale economies, its accumulation will have a specific law of motion which will characterise the growth process. In traditional neoclassical growth models, where physical capital is the only factor that can be accumulated, both capital and labour income taxes reduce the steady-state level of income but have only a transitory effect on the rate of growth - although the taxation of labour (which affects the work-leisure choice) is superior to the taxation of capital, which reduces the rate of return on savings. So low tax rates biased towards wages appear to be justified. However, once publicly provided human capital is included in the model, it would appear that not only is quite high taxation justified in the short run to allow for the accumulation of government assets, but also taxes should be levied on wealth (ie physical and human capital) rather than incomes in order to minimise substitution effects (Milesi-Ferretti & Roubini, 1996).

Neither the trade-immigration or the endogenous growth literature appear to have integrated the more recent reality of global capital market integration into their analysis. Nor do they distinguish clearly between the role of labour as recipient of wages on the one hand, and the citizen as holder of social entitlements on the other. The problem arises because if capital receives a single return worldwide, and wages are equal to the marginal product of labour in each country, incomes per capita should equalize once differences in skill composition are accounted for. This is clearly not the case, basically because - as endogenous growth theory tells us - because there is also a large difference in 'social infrastructure' endowment, which explains a large part of international income differentials.

We approach this issue by attempting to answer the following question:

*in a world of fully mobile private capital, immobile homogeneous labour and social infrastructure specific to a particular country, what is the economic value of the passport to the citizens of that country?*

In order to tackle this problem, we have constructed a simple partial-equilibrium endogenous growth model in the tradition of Romer (1986) and Scott (1989), which will clearly identify the relative role of labour supply (endogenously growing through population growth), capital

supplied from domestic savings and international capital markets (and which embodies any technological progress), and social overhead capital ('infrastructure') which reflects the endowment of productive factors which is collectively owned and specific to that particular country - the ultimate 'non-traded good'.

### **An Economy with Global Capital Market Access and Tax-financed Infrastructure**

Consider a world economy where there are three homogenous factors of production: capital ( $K$ ), labour ( $L$ ) and 'infrastructure' ( $J$ ). Capital is privately owned and perfectly mobile internationally. Labour cannot move because it is restricted to national territories ( $i$ ); and infrastructure is socially owned and fixed once installed in any one country. Capital and labour are rewarded according to their respective marginal products, while infrastructure is financed by a tax at a fixed rate ( $z$ ) wages and profits.

The notion we wish to explore is that the 'value of the passport' reflects the citizen's claim on that part of output ( $Y$ ) that is strictly attributable to infrastructure ( $J$ ) under the conditions defined above. This requires that first we set up a model of how such an economy works. In order to analyse this definition, we set up a simple model for the  $i$ th country based on a familiar production function with fixed production coefficients ( $\alpha$ ,  $\beta$ ,  $\gamma$ ) and a country-specific constant ( $A$ ) reflecting total factor productivity:

$$Y = A_i \cdot K_i^{\alpha_i} \cdot L_i^{\beta_i} \cdot J_i^{\gamma_i} \quad (1)$$

From now on until the closing part of this section we will drop the country subscript.

We must now explain the behaviour of the four variables in [1]. First, we assume that general productivity change not attributable to any one factor (that is 'total factor productivity growth') is captured by an exogenous rate of change ( $a$ ):

$$A = A_{-1}(1+a) \quad (2)$$

Capital is internationally mobile, and thus receives a single real rate of return ( $r^*$ ), determined on the international capital market and independent of marginal changes in the capital stock of any one economy. The domestic capital stock ( $K$ ) adjusts (using domestic *and* foreign savings) until the domestic rate of return - the marginal product of capital net of tax at rate ( $z$ ) - is equal to the international rate:

$$\frac{\delta Y}{\delta K}(1-z) = r^* \quad (3)$$

Differentiating [1] with respect to capital ( $K$ ) and substituting into [2] yields the capital-output ratio which corresponds to the capital market equilibrium solution:

$$\frac{K}{Y} = \frac{\alpha(1-z)}{r^*} \quad (4)$$

Note that a higher tax rate ( $z$ ) to finance infrastructure provision will reduce the capital-output ratio (reflecting the fiscal ‘crowding-out’ of private by public investment, so to speak), as will an increase in the international rate of return ( $r^*$ ).

The labour market is very simple as labour is internationally immobile and full employment is assumed. So labour supply ( $L$ ) is determined by the rate of demographic expansion ( $n$ ) of the economically active population:

$$L = L_{-1}(1+n) \quad (5)$$

and the wage (after tax) is equal to the marginal product of labour in the usual way, found by differentiating [1] with respect to  $L$ :

$$w = \frac{\delta Y}{\delta L}(1-z) = \beta \frac{Y}{L}(1-z) \quad (6)$$

This is, incidentally, the value of a work permit as opposed to a passport.



Infrastructure ( $J$ ) is provided by the government and funded by the corresponding tax rate ( $z$ ). The 'law of motion' for infrastructure expansion is thus given by annual tax funding less the depreciation at a given rate ( $d$ ) of the existing infrastructure:

$$J = J_{-1}(1 - d) + z.Y \quad (7)$$

The infrastructure tax rate ( $z$ ) in this model is endogenous. The government sets this tax rate so as to achieve the balance between labour, capital and infrastructure that maximises aggregate income ( $Y$ ). This is achieved at the point where output is maximized with respect to the tax rate:

$$\frac{\delta Y}{\delta z} = \alpha \cdot \frac{\delta K}{\delta z} \cdot \frac{Y}{K} + \gamma \cdot \frac{\delta J}{\delta z} \cdot \frac{Y}{J} = 0 \quad (8)$$

Differentiating [4] and [7] with respect to  $z$  and substituting into [8] yields an equilibrium solution for the optimal balance between private capital and public infrastructure where:

$$\frac{K}{J} = \frac{\alpha^2}{\gamma \cdot r^*} \quad (9)$$

This is in fact a maximum because the second-order condition:

$$\frac{\delta^2 Y}{\delta z^2} = \left[ \frac{rK}{\alpha} \right]^2 \cdot \left[ \frac{\gamma - K}{J} \right] \cdot [1 - z]^{-3} < 0 \quad (10)$$

is clearly met so long as  $I > z > 0$ .

We can now solve for the equilibrium tax rate ( $z$ ). The ratio of infrastructure to output is simply derived from [4] and [10]:

$$\frac{J}{Y} = (1 - z) \frac{\gamma}{\alpha} \quad (11)$$

In the ‘steady state’ (for a given international interest rate) the ratios of  $K$  and  $J$  to  $Y$  will in fact be stable, because as we shall see the tax rate ( $z$ ) is entirely a function of the parameters of the model. The steady state rate of growth ( $x$ ) is thus easily derived from [1] as:

$$x = \frac{a + \beta n}{1 - \alpha - \gamma} \quad (12)$$

For small values of  $x$ ,  $d$ , can derive from [7]

$$z = \frac{x + d}{1 + x} \cdot \frac{J}{Y} \quad (13)$$

And finally substituting [11] into [13] we have a solution for the tax rate:

$$z = \frac{\alpha(x+d)}{\alpha(x+d) + \gamma(1+x)} \quad (14)$$

Note that for positive values of the coefficients, the tax rate lies within the logical range ( $0 < z < 1$ ).

We now have a solutions for  $K$ ,  $J$ ,  $L$ ,  $Y$  as well as for the equilibrium tax rate ( $z$ ) and growth rate ( $x$ ). We can thus proceed to find the ‘passport value’

### **Passports, Work Permits and Free Migration**

The ‘social dividend’ we shall define as the difference between per capita income net of capital charges and tax on the one hand and the marginal product wage (net of tax) on the other.

Note that migrant workers (ie. those without citizenship and thus the dividend) would just receive the post-tax marginal product wage, while foreign investors would just get the post-tax marginal return on capital.

We thus define the current value ( $q$ ) of the passport as the citizen’s ‘share’ of the residual of national income ( $Y$ ) after the return to labour ( $w$ ) and the return to capital ( $r$ ):

$$q = \frac{1}{L}(Y - w.L - r.K) \quad (15)$$

the capitalised value of which over the remaining life of the passport-holder (T) is clearly

$$Q = \sum_{t=0}^T \frac{q_t}{(1+r)^t} \approx \frac{q}{r} \quad (16)$$

Substituting [4] and [6] into [15] gives  $q$  in terms of per capita income ( $y=Y/L$ ):

$$q = y[1 - (\alpha + \beta)(1 - z)] \quad (17)$$

and then by substituting [14] into [17] finally yields a solution in per capita income, the growth rate and the parameters:

$$q = y[1 - \frac{\gamma(1+x)(\alpha+\beta)}{\gamma(1+x) + \alpha(x+d)}] \quad (18)$$

with a capitalized value from [16] of

$$Q = q/r^* \quad (19)$$

Clearly, for  $q > 0$ , the composite coefficient ( $\theta$ ) in [18] must be less than unity:

$$\theta = \frac{\gamma(1+x)(\alpha+\beta)}{\gamma(1+x) + \alpha(x+d)} < 1 \quad (20)$$

This seems to be so for reasonable parameter values, and formally for small  $x$ ,  $d$  it is clear that this condition is met not only by the usual Cobb-Douglas condition that all three the coefficients sum to unity, but by the less restrictive condition that  $\alpha + \beta < 1$  and thus overall scale economies are possible.

Note that if the three coefficients do sum to unity and  $x$ ,  $d$  are nearly zero, then the passport

value reduces to the intuitively convincing value equivalent to the familiar labour and capital shares of aggregate income derived from the Cobb- Douglas model:

$$q = \gamma \cdot y \quad (21)$$

Note also that an increase in the world interest rate ( $r^*$ ) will not affect the right hand terms in [14], but by reducing the capital stock through [5] will actually reduce per capita income ( $y$ ), so the passport value will fall - and the capitalized value ( $Q$ ) fall even more strongly!

We have established the value ( $q$ ) of a passport in absolute terms. However presumably the 'price' that potential immigrants would be prepared to pay depends upon where they come from and thus their 'reserve price'. The demand for passports from country 'i' by citizens of country 'j' depends upon the relative values  $q_i - q_j$  and thus not only on the per capita incomes ( $y_i, y_j$ ) but also on any differences in the factor coefficients ( $\alpha, \beta, \gamma$ ) from [18]:

$$q_i - q_j = y_i(1 - \theta_i) - y_j(1 - \theta_j) \quad (22)$$

Of course, if the immigrant can sell her existing passport at  $q_j$ , then she will be willing to purchase the other at the full price  $q_i$ ; other wise the market will settle at the difference. It should also be remembered that a passport in effect contains a work permit as well: these have an annual value ( $p$ ) to the migrant (who can always return home and thus has a reserve price) equivalent to the difference between post-tax wages in the two countries as defined in [6]:

$$p_{ij} = y_i\beta_i(1 - z_i) - y_j\beta_j(1 - z_j) \quad (23)$$

So far, we have assumed that labour is immobile, and examined what immigrants are prepared to pay for a passport. At what price would rich countries be prepared to offer one? One approach would be to suggest that this should be done at the 'Pareto price' ( $g$ ) defined as the payment of a sum such that (suitably distributed) the per capita income of existing citizens would not be reduced (Giersch, 1996). In terms of our model, as labour is homogeneous and capital demands the same return worldwide, the Pareto price is the marginal social cost of an extra immigrant.

$$g = - \frac{\delta(Y/L)}{\delta L}L = (1 - \beta)y \tag{24}$$

By inspection, we can see that whether  $g >$  or  $< q$  depends on the exact parameter values. Of course if  $g > q$ , there would be no market for passports. In the simple Cobb-Douglas case illustrated in [21], then

$$g = (\alpha + \gamma)y > q \tag{25}$$

So there would be no demand at the Pareto price and it would act as an effective bar to further immigration.

**Some empirical evidence**

Our first approximation is derived from ‘benchmark’ data for the three production coefficients) provided in the literature, plus the assumption that for a representative country total factor productivity growth ( $a$ ) is 1 percent per annum, labour force growth ( $n$ ) is 2 percent per annum, the social infrastructure depreciates at a rate of 2 percent per annum (that is, it lasts for 50 years) and the discount rate is 5 percent per annum. Table 1 gives the results of the relevant calculations carried out by imputing into our model solutions the parameter values listed above and production coefficients determined empirically from econometric estimates by Barro & Sali-i-Martin (1995) and Mankiw & associates (1992) respectively, and a ‘Cobb-Douglas’ form with equal coefficients as a standard of comparison.

TABLE 1: BENCHMARK RESULTS FOR THE MODEL

	<i>alpha</i>	<i>beta</i>	<i>gamma</i>	<i>x</i>	<i>z</i>	<i>q/y</i>	<i>Q/y</i>
<i>Barro</i>	0.30	0.20	0.50	0.070	0.048	0.524	10.5
<i>Mankiw</i>	0.31	0.41	0.28	0.044	0.064	0.326	6.5
<i>Cobb-D</i>	0.33	0.33	0.33	0.050	0.063	0.381	7.6

From what seem to be a reasonable range of parameter values for the production function, we derive a range of optimal infrastructure tax rates of 4.8 to 6.4 percent; and an annual passport

value of 38 to 52 percent of annual per capital income. Are these results at all realistic? These are, of course, optimal solutions - as is revealed by the high implicit growth rates ( $x$ ) which assume that the government has set an optimal tax rate ( $z^*$ ) and there is unlimited access to international capital flows so there is no savings constraint. None the less, the implicit tax rate does not seem unrealistic and while the implication that between a third and a half of average incomes derives from social overhead capital is itself no more than the result of attributing a particular parameter value to its coefficient ( $\gamma$ ) in the production function. The capitalized value of citizenship ( $Q$ ) at six to ten times annual income may seem high, but it should be remembered that the ratio of house prices to annual earnings used by mortgage lenders is of the order of four to five times.

In the real world of course, we can only observe the tax rates determined by multiple historical and political-economy considerations and the growth rates actually achieved in practice. First, Tables 2 and 3 display our estimates of the current values of the 'infrastructure tax' ( $z$ ). Taxes are not hypothecated for such a purpose of course, so we have estimated the proportion of total government expenditure which can be attributed to the social infrastructure under two definitions, and applied this to the total tax rate. In Table 2, 'Definition A' includes government expenditure on health, education, welfare, housing, transport and communications; in Table 3 'Definition B' includes the rather more restricted list of government expenditure on education and health plus capital expenditure on welfare, housing, transport and communications.

The observed tax rates can then be compared with what the model would suggest they should be on the basis of the 'Barrow' and 'Mankiw' estimates of the production coefficients on the one hand, and the observed rates of growth on the other. It is evident from Tables 2 and 3 that there is a considerable deviation between the observed and 'expected' tax rates, but the orders of magnitude are very similar, which is reassuring. The divergence is due to both our very crude definitions of the categories measured and the institutional factors determining social expenditure. However, we have not yet been able to discern a pattern of divergence that might be tested systematically. Initial statistical analysis reveal statistically insignificant correlations between the various real and estimated values of  $z$ .

Finally, Table 5 shows the resulting ‘passport values’ calculated in two ways: first, by using the observed values of growth (x) and (z) applied to observed per capita income (y) for the Barro and Minkiw parameter values respectively; and second, by using the ‘benchmark’ values for x and z from Table 1 applied to the observed income levels, again with the two parameter sets. The resulting estimates for the value of different countries’ passports are of some interest: that for the USA, for instance, appears to average around \$100,000 between the four estimates; while those for Argentina and Peru are \$30,000 and \$5,000 respectively.

Unfortunately there is little direct evidence of the market value of passports, for obvious reasons. None the less

“Rich Chinese mostly from Hong Kong and Taiwan can buy genuine passports and citizenship of Bolivia, Honduras, Argentina, Belize and other Central American countries at \$12, 000 to \$35, 000.” (‘Citizenship for a price’ *The Nation*, Bangkok, September 30, 1996).

Although this might be taken as a market valuation of citizenship in these countries, it is evident from Table 4 that in economic terms a Taiwanese or Hong Kong passport is ‘worth’ more than a Latin American as such: clearly the acquisition of the latter is only the first step in a long journey towards the real objective - “to enter ‘Golden Mountain’ (USA)” (*loc. cit.*).

TABLE 2: THE SOCIAL INFRASTRUCTURE TAX 'z' - DEFINITION A

	Govt Total Rev / GNP	Social Infrastruct ure <sup>a</sup> / Govt Exp	Total Govt Exp / GNP	Social Infrastruct ure / GNP	<b>z</b>	<b>z-BS</b>	<b>z-MRW</b>
Canada	22.1	51.9 <sup>cd</sup>	25.8	13.4	<b>2.96<sup>j</sup></b>	<b>5.4</b>	<b>2.3</b>
France	40.7	68.6	45.5	31.2	<b>12.69</b>	<b>5.9</b>	<b>2.7</b>
Germany	31.6	63.5	33.6	21.3	<b>6.73</b>	<b>6.9</b>	<b>3.4</b>
Italy	41.8	65.3 <sup>i</sup>	53.4	34.8	<b>14.54</b>	<b>7.2</b>	<b>3.7</b>
Japan	-	-	-	-	-	<b>7.3</b>	<b>3.4</b>
Netherlands	50.7	68.3 <sup>cd</sup>	53.9	36.8	<b>18.65</b>	<b>5.3</b>	<b>2.2</b>
UK	36.2	51.9 <sup>ce</sup>	38.2	19.8	<b>7.16</b>	<b>7.1</b>	<b>3.6</b>
US	19.7	53.5 <sup>cd</sup>	23.8	12.7	<b>2.50</b>	<b>6.7</b>	<b>3.2</b>
Argentina	11.3 <sup>b</sup>	64.0 <sup>cfi</sup>	11.1 <sup>i</sup>	7.1	<b>7.98</b>	<b>2.7</b>	<b>0.5</b>
Brazil	26.6	43.9 <sup>ce</sup>	25.6	11.2	<b>2.97</b>	<b>5.1</b>	<b>2.1</b>
Chile	24.4	64.2	22.6	14.5	<b>3.53</b>	<b>7.0</b>	<b>2.9</b>
Colombia	20.3 <sup>b</sup>	40.3 <sup>ci</sup>	19.9 <sup>i</sup>	8.1	<b>1.62</b>	<b>2.2</b>	<b>3.6</b>
Mexico	13.9 <sup>b</sup>	25.0 <sup>egi</sup>	17.8 <sup>i</sup>	4.4	<b>0.61</b>	<b>1.0</b>	<b>2.6</b>
Peru	10.8	-	14.0	-	-	<b>1.0</b>	<b>1.9</b>
Venezuela	18.0	-	19.2	-	-	<b>3.1</b>	<b>0.5</b>
Hong Kong	-	-	-	-	-	<b>11.1</b>	<b>6.0</b>
Singapore	26.6	39.9 <sup>c</sup>	19.7	7.8	<b>2.07</b>	<b>5.4</b>	<b>1.2</b>
S. Korea	19.8	38.0 <sup>ch</sup>	17.1	6.5	<b>1.28</b>	<b>16.2</b>	<b>9.8</b>
Taiwan	-	-	-	-	-	<b>19.0</b>	<b>12.1</b>

Data from World Development Report 1995. Data refer to 1993 unless otherwise indicated

<sup>a</sup> Social Infrastructure includes government expenditure on health, education, welfare, housing and when available, transport and communications.

<sup>b</sup> Data from World Data Base 1991-1994, The World Bank ( 1990, 1992, 1989 respectively for the countries in question).

<sup>c</sup> includes transport and communications government expenditure

<sup>d</sup> 1994 <sup>e</sup> 1992 <sup>f</sup> 1990 <sup>g</sup> 1989 <sup>h</sup> 1995

<sup>i</sup> data obtained from Government Financial Statistics Yearbook, 1995, IMF

<sup>j</sup> 'z' is obtained as the product of the social infrastructure ratio times the total revenue ratio



TABLE 3: THE SOCIAL INFRASTRUCTURE TAX 'Z' - DEFINITION B

	Govt Total Rev / GNP	Social Infrastruct ure* / Govt Exp	Total Govt Exp / GNP	Social Infrastruct ure* / GNP	<b>z</b>	<b>z BS</b>	<b>zMRW</b>
Canada	22.1	10.0 <sup>cd</sup>	25.8	2.58	<b>0.57<sup>j</sup></b>	<b>5.4</b>	<b>2.3</b>
France	40.7	23.1	45.5	10.51	<b>4.27</b>	<b>5.9</b>	<b>2.7</b>
Germany	31.6	17.6	33.6	5.91	<b>1.86</b>	<b>6.9</b>	<b>3.4</b>
Italy	41.8	29.6 <sup>i</sup>	53.4	15.8	<b>6.60</b>	<b>7.2</b>	<b>3.7</b>
Japan	-	-	-	-	-	<b>7.3</b>	<b>3.4</b>
Netherlands	50.7	26.8 <sup>cd</sup>	53.9	14.44	<b>7.30</b>	<b>5.3</b>	<b>2.2</b>
UK	36.2	19.4 <sup>ce</sup>	38.2	7.41	<b>2.68</b>	<b>7.1</b>	<b>3.6</b>
US	19.7	21.8 <sup>cd</sup>	23.8	5.18	<b>1.02</b>	<b>6.7</b>	<b>3.2</b>
Argentina	11.3 <sup>b</sup>	17.8 <sup>cfi</sup>	11.1 <sup>i</sup>	1.96	<b>0.22</b>	<b>2.7</b>	<b>0.5</b>
Brazil	26.6	13.9 <sup>ce</sup>	25.6	3.55	<b>0.90</b>	<b>5.1</b>	<b>2.1</b>
Chile	24.4	24.9	22.6	5.62	<b>1.37</b>	<b>7.0</b>	<b>2.9</b>
Colombia	20.3 <sup>b</sup>	30.9 <sup>ci</sup>	19.9 <sup>i</sup>	6.14	<b>1.24</b>	<b>2.2</b>	<b>3.6</b>
Mexico	13.9 <sup>b</sup>	15.6 <sup>cgi</sup>	17.8 <sup>i</sup>	2.77	<b>0.38</b>	<b>1.0</b>	<b>2.6</b>
Peru	10.8	-	14.0	-	-	<b>1.0</b>	<b>1.9</b>
Venezuela	18.0	-	19.2	-	-	<b>3.1</b>	<b>0.5</b>
Hong Kong	-	-	-	-	-	<b>11.1</b>	<b>6.0</b>
Singapore	26.6	30.9 <sup>c</sup>	19.7	6.08	<b>1.61</b>	<b>5.4</b>	<b>1.2</b>
S. Korea	19.8	26.8 <sup>ch</sup>	17.1	4.58	<b>0.90</b>	<b>16.2</b>	<b>9.8</b>
Taiwan	-	-	-	-	-	<b>19.0</b>	<b>12.1</b>

Data from World Development Report 1995.

\* social infrastructure as government expenditure on education; health; the capital expenditure share on welfare; housing; and when available transport and communications (capital portion on government expenditure from Government Financial Statistics Yearbook, 1995)

<sup>a</sup> Data refer to 1993 unless otherwise indicated

<sup>b</sup> Data from World Data Base 1991-1994, The World Bank ( 1990, 1992, 1989 respectively for the countries in question ).

<sup>c</sup> includes transport and communications government expenditure

<sup>d</sup> 1994 <sup>e</sup> 1992 <sup>f</sup> 1990 <sup>g</sup> 1989 <sup>h</sup> 1995

<sup>i</sup> data obtained from Government Financial Statistics Yearbook, 1995, IMF

<sup>j</sup> 'z' is obtained as the product of the social infrastructure ratio times the total revenue ratio.

TABLE 4: PASSPORT VALUES FROM THE MODEL

	Economic Values of Passports							
	q-unit				Q			
			Benchmark				Benchmark	
	BS	MRW	BS	MRW	BS	MRW	BS	MRW
canada	0.407	0.305	0.52	0.33	81182	60985	103844	65901
france	0.424	0.292	0.52	0.33	95414	65601	116948	74217
germany	0.441	0.299	0.52	0.33	103989	70509	122512	77748
italy	0.455	0.299	0.52	0.33	90223	59386	103168	65472
japan	0.434	0.316	0.52	0.33	136706	99571	163748	103917
netherla	0.405	0.300	0.52	0.33	84769	62945	108940	69135
uk	0.448	0.300	0.52	0.33	80980	54161	93912	59598
us	0.435	0.300	0.52	0.33	107512	74124	128648	81642
argentin	0.339	0.414	0.52	0.33	26170	31968	40144	25476
brazil	0.403	0.297	0.52	0.33	11818	8705	15236	9669
chile	0.421	0.343	0.52	0.33	13361	10872	16484	10461
colombia	0.367	0.125	0.52	0.33	5136	1752	7280	4620
mexico	0.368	0.052	0.52	0.33	13273	1870	18772	11913
peru	0.291	0.033	0.52	0.33	4338	493	7748	4917
venezuel	0.350	0.509	0.52	0.33	9926	14463	14768	9372
HongKo	0.478	0.340	0.52	0.33	86410	61382	93912	59598
Singapor	0.401	0.526	0.52	0.33	79581	104420	103220	65505
S.Korea	0.521	0.367	0.52	0.33	39928	28109	39832	25278
Taiwan	0.545	0.380	0.52	0.33				

## Conclusions

In this paper we have established from a simple partial equilibrium endogenous growth model that in a world of fully mobile capital and fully immobile labour, per capita incomes do contain a substantial element derived from the social infrastructure accumulated by an optimally-taxing government. Therefore a passport (ie citizenship) can be considered as an economic asset with an annual value that can be defined as the difference between national income net of capital charges, wage costs and taxes and divided equally among the population. This value we have shown to depend on per capita income, the rate of growth and the parameters of the production function.

Our preliminary empirical estimates are necessarily very approximate, but do indicate that citizenship can be an important component of the international dispersion of per capita income, independently of the labour skills or capital endowment. A more definitive estimate would require considerable further

research based on more accurate data on factor endowments and a more complete definition of ‘human’ (ie skill) as opposed to ‘social’ capital as discussed in Wood (1994).

Meanwhile, it does seem reasonable to conclude that one of the major inconsistencies inherent in the emerging model of a global economy is the effective prohibition on international labour mobility which, as we have shown, makes citizenship an economic endowment of unequal value. It could be argued, of course, that the accumulated social capital in any one country is the result of the tax payments made by previous generations of citizens, which are then ‘bequeathed’ to succeeding generations in that country. In a sense this is clearly true. However, the canonical contractarian assessment for the economic justice of a particular set of institutional arrangements involves a test based on the ‘veil of ignorance’ Rawls (1972). In our case this would presumably be whether a rational person would be willing to be born into (or have her children born into) the world irrespective of her citizenship. To the extent that the answer would clearly negative - and this would not just be a question of cultural identity but rather of life opportunities derives from social infrastructure entitlements - than the present international arrangements can be rigorously defined as ‘unjust’ so long as the world can be conceived as a political community. Principles of justice *are* relevant here, even in liberal political theory, because international trade and investment activities produce substantial common benefits - particularly to the industrialized countries best able to take advantage of them - while participation in the global economy is effectively non-voluntary for poor countries in practice (Beitz, 1979).

United Nations resolutions, from Chapters IX and X of the Charter itself through to the 1986 Declaration of the Right to Development, also recognize the obligation of the international community to deal with the international distribution of income directly; indeed under international public law “there is probably also a collective duty of member states to take responsibility to create reasonable living standards both for their own peoples and for those of other states” (Brownlie, 1990: 259). This obligation is of course one of the underpinnings of international development cooperation between states (DAC, 1996), and can be seen as the basis of a potential global wealth tax (FitzGerald 1997). In effect, a tax on accumulated social infrastructure in rich countries could be levied in order to fund to an equivalent buildup in poor countries in default of a liberalization of the global labour market.

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