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ABSTRACT

Between Agora and Shopping Mall^{*}

Advertisements provide consumers with knowledge about private products, whereas political information is required to provide voters with knowledge of public issues. Modern information technologies and globalization are increasing the exposure of individuals to information. Goods advertising is competing with political information for people's attention. This paper presents a politico-economic equilibrium model in which the tension between private and public agendas can be analysed. It is shown that in an information-rich society, international goods market integration tends to reduce the quality of public policy. Complementing economic integration with political integration can increase the gains from globalisation, though not in all cases.

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1 Introduction

What is the talk of the town, or rather what is the talk of the “global village”? The things we want to have? Or the political topics that are occupying the media? This paper presents a politico-economic equilibrium model in which private and public goods compete for the attention of consumers and voters.

We are used to thinking of politics and economics as separate spheres of society. Producers and consumers meet in the marketplace, but policy happens elsewhere – in the agora, at the ballot box and in parliament. However, economic products and political issues meet each other in the space where information competes for people’s attention. In an information-rich society, where attention is a scarce resource (Simon, 1971), this leads to a new relationship between politics and economics. For instance, some observers have suggested that commercial information is crowding out political information: in the traditional marketplace, individuals come together to deal both with economic goods and politics, but the public spaces in modern cities are flooded by advertisements and the shopping mall has taken over from the forum.

Obviously, it is not space in the sense of a particular geographical area that is important in the competition for attention, rather the space in which information processing takes place - the media through which information is distributed and each individual’s brain. Attention psychology teaches us that an individual’s capacity of perception is limited.¹ But maybe even more important is the fact that – despite the quasi-unbounded media of mass communication – the effective use of

¹Kahneman (1973). For a survey of the psychological literature on attention, see Pashler (1998).

information is highly concentrated. A salient proof of this fact is provided by the “laws of the Web” (Huberman, 2001), which indicate that user attention focuses on a quite limited set of items. This paper accounts for the reality of limited attention by imposing an upper bound on the sum of pieces of information (about different private products and public issues) that can be processed by an individual.

Globalisation is usually seen as an example of market integration. Lower transportation costs and the reduction of other trade barriers promote international competition and trade. In this paper, transportation costs are assumed to be zero. In this sense, the paper reflects the “death of distance” approach to trade. This allows us to focus instead on the increase in the range of information distribution. Global information technologies allow advertisements to cross borders. Therefore, competition for attention takes place at the international rather than the national level. In the debate about globalisation and cultural diversity, it has been pointed out that international goods trading affects lifestyles, world views and freedom of choice (Cowen, 2002).² This paper focuses on the question as to how global distribution of information affects the allocation of resources between private and public sector. Under economic integration, firms can address consumers globally with their advertisements. Under political integration, political issues are also discussed and decided at the global level. The crucial question is: Does it matter whether or not economic integration is accompanied by political integration?

In order to answer this question, the paper presents a model in which individuals are consumers and citizens who choose from the set of alternatives brought to their

²See Olivier, Thoenig and Verdier (2007) for a microfounded model for the impact of trade on cultural identity.

attention. In line with the informative view on advertising (Ozga, 1960 and Stigler, 1961), firms provide consumers with knowledge about consumption opportunities. In an analogous way, policy provides voters with knowledge about alternative public goods. As consumers, individuals spread their money optimally over the set of products brought to their attention. As citizens, they vote on the public projects that have been “advertised”, anticipating that they will have to finance the projects through their tax payments. The competition between firms for consumers with limited attention has been analysed in Falkinger (forthcoming). This paper adds the new aspect of competition for voters and describes the politico-economic equilibrium. A comparative-static equilibrium analysis will show the tensions that may arise between the economic and the political arenas when modern information technologies are in operation. In particular, we will see how the globalisation of information affects the allocation of resources between the private and public sector, and which implications this has for welfare.

By considering both economic and political integration simultaneously, the analysis is also concerned with the question as to what is the role of economic integration for an optimal size for states, raised by Alesina and Spolaore (1997). These authors argue that economic integration lowers the cost of political disintegration, which people value because of national preferences. Such considerations are ignored in this paper. The question as to whether economic or political integration is desirable is examined for standard preferences. People draw utility from both private and public consumption. As regards the assessment of the virtues and defects of economic and political integration, only their effects on the size and diversity (quality)

of the public and the private sectors are considered to be relevant.

The paper is organised as follows. Section 2 presents the model and describes the equilibria in the public and private sectors, respectively. The general equilibrium is analysed in Section 3. Sections 4 and 5 deal with the impact of globalisation on the quality and diversity of policy. Both international economic integration and international political integration are considered. Section 6 summarises the main findings.

2 Model

The world consists of a mass $\bar{R} > 1$ of identical individuals. The population can be divided into subpopulations. This will allow us to address the issue of international integration by varying the size of the consumer population that can be addressed by firms, and the size of the voter population in the public sector. Each individual has income y and derives utility from private and public consumption. Let X and G be the subutilities achieved by consuming private and public goods, respectively. Then the total utility of an individual is given by the utility function

$$U(X, G) = X^\alpha G^\beta, \quad (1)$$

with $\alpha \in (0, 1)$, $\beta = 1 - \alpha$.

In the private sector, firms supply differentiated products under monopolistic competition – as modelled by Dixit and Stiglitz (1977). Each product is advertised to $r_X \in (1, \bar{R}]$ consumers. $r_X < \bar{R}$ means that firms have only local range, whereas if $r_X = \bar{R}$, then they are global players. Let \mathbf{M}_i be the set of items advertised to an

individual i . The size of \mathbf{M}_i , denoted by M , is identical for all i . The utility derived from consuming quantity x_s , $s \in \mathbf{M}_i$, is given by the CES index

$$X_i = \left[\int_{\mathbf{M}_i} x_s^\rho ds \right]^{1/\rho}, \quad 0 < \rho < 1. \quad (2)$$

In an analogous way, the public sector provides a variety of public goods. The world population is divided into $n \geq 1$ identical nations. Political integration means that n diminishes towards one. Each public good is financed and consumed by a range $r_G = \bar{R}/n$ of citizens. r_G may differ from r_X . For instance, $r_G < \bar{R}$ and $r_X = \bar{R}$ describes a world in which the public sector is organised regionally, whereas firms operate globally. In contrast, under conditions of global political integration, $r_G = \bar{R}$. Let \mathbf{I}_i be the set of public goods consumed by individual i . The measure of \mathbf{I}_i , denoted by I , is identical for all i . The utility derived from the public sector is given by

$$G_i = \left[\int_{\mathbf{I}_i} (qg_k r_G^{-\gamma})^\varphi dk \right]^{1/\varphi}, \quad 0 < \varphi < 1, \quad (3)$$

where g_k , $k \in \mathbf{I}_i$, is the quantity provided of public good k , measured in units of money. q is the quality of policy. Higher quality of policy means that the same amount of public budget generates more service for the citizen, measured in efficiency units. q is exogenous from the point of view of individual agents, but may depend on the available resources for political information, as will be discussed later. Parameter γ (with $0 \leq \gamma \leq 1$) represents the degree of rivalry in public consumption. To exclude scale effects specific to public goods, full rivalry (i.e., $\gamma = 1$) is assumed in the main analysis. This makes the public sector fully comparable to the private sector.

The individual budget constraint is given by the equation

$$\int_{\mathbf{M}_i} p_s x_s ds + \int_{\mathbf{I}_i} \frac{g_k}{r_G} dk + t_0 = y, \quad (4)$$

where p_s denotes the price of product s . g_k/r_G is the tax cost per voter of public good k , and t_0 is a lump-sum tax. Individuals maximise their utility by choosing x_s as a consumer and deciding about the provision of g_k as a voter.

Each product variant is produced by a monopolist. The variable costs of production are assumed to be constant and are given by c . In order to bring a private or a public good to people's attention, the good has to be advertised at a certain strength. This requires spending fixed costs A per advertised item. For the moment, A is an exogenous constant. In Section 5, we will consider the possibility that competition for attention drives up the advertising expenditure required. Firms cover the advertising costs with the product price, which exceeds marginal production costs because of monopolistic competition. Political advertisements are financed by the lump-sum tax t_0 . Thus, if policy covers a population of size r_G , and I public goods are promoted, then

$$t_0 = IA/r_G. \quad (5)$$

Limited attention is modelled in the following way. Each individual is endowed with time $\tau_0 (> 1)$ for processing information. The perception of M product variants requires M units of time. Let $h \leq 1$ be the time used for processing information about a public good on the voting agenda. Then, if I items are on the agenda, the processing of political information requires hI units of time. h accounts for the possibility that political issues may be more or less carefully evaluated by individuals.

In sum, we have the attention constraint

$$M + hI \leq \tau_0. \quad (6)$$

Time h affects the citizens' knowledge about the public goods to be provided. This feeds back into the quality of public good provision. We account for this fact in the simplest possible way – by assuming that q equals h .

3 Equilibrium

Each household solves the following problem:

$$\max_{x_s, g_k} U \quad \text{s.t. (2) - (4)}. \quad (7)$$

This implies for the product variants for private consumption isoelastic demand curves with elasticity $\frac{1}{1-\rho}$ (absolute value). (The main text focuses on the presentation and explanation of the equilibrium values. The formal derivation is provided in Appendix A.)

Given profit maximisation in monopolistic firms, the equilibrium price in the private sector is $p_X = c/\rho$. A firm selling x units to r_X consumers earns the operating profit $r_X(p - c)x$. This profit must cover advertising cost A , which is required to draw the consumers' attention to the firm's product variant. Hence, under conditions of free entry, the equilibrium quantity sold to a consumer is given by

$$x = \frac{A}{r_X} \frac{\rho}{(1 - \rho)c}. \quad (8)$$

As a voter, an individual chooses for each public good the preferred level of public

provision according to (7). This gives us

$$g = \frac{\beta r_G (y - t_0)}{I} \quad (9)$$

in equilibrium.³ A share β of total disposable income (after deduction of the lump-sum tax) is allocated to public consumption and spread uniformly over the set of public goods.

This leaves for a consumer's spending in the private sector the amount $\alpha(y - t_0)$, which, in view of $p_X = c/\rho$ and (8), implies

$$M = \frac{(1 - \rho)\alpha r_X (y - t_0)}{A} \quad (10)$$

for the equilibrium diversity of private consumption. As a result, the utility derived from the private consumption sector is equal to the following expression:

$$X = M^{\frac{1}{\rho}-1} \alpha (y - t_0) \rho / c. \quad (11)$$

By contrast, the utility provided by the public sector is given by⁴

$$G = I^{\frac{1}{\varphi}-1} h \beta (y - t_0). \quad (12)$$

In addition, both the government's budget constraint and the attention constraint must hold in an equilibrium. In the following analysis, we distinguish between two different situations. In the first situation, the set of public issues is given exogenously. In this case, the lump-sum tax t_0 and the time h devoted to the processing of political information adjust until the two constraints (5) and (6) are satisfied. This regime is

³Use (A10) from Appendix A, accounting for $p_G = 1/r_G$, $\Gamma = \beta/\alpha$ and $\alpha + \beta = 1$.

⁴See (A11) - (A14) for a full derivation of (10) - (12). Note that $1 + \Gamma = 1/\alpha$ and $\Gamma/(1 + \Gamma) = \beta$, and use $q = h$. Moreover, $\gamma = 1$ is assumed to exclude non-rivalry in public consumption.

discussed in the next section. The second situation, considered in Section 5, assumes that a fixed budget is reserved for expenditure on political information, that is, t_0 is fixed exogenously. The time required for the processing of information about a certain political issue is also held constant (at $h = 1$). In this case, the diversity of the political agenda I adjusts in such a way that constraints (5) and (6) are met.

4 The impact of global advertising on the quality of public policy

All societies have to deal with a certain set of political issues. That is, there is an agenda of exogenously given problems to be solved. Let the size of this agenda be normalised to one. Before voters can decide about how much to spend on each of the topics on the political agenda, the government has to inform them about these topics. Assuming that the cost of informing the public about a topic through the media is equal to A_0 , we have for the tax cost of political information

$$t_0 = \frac{A_0}{r_G}. \quad (13)$$

For $I = 1$ and (13), the equilibrium values for the utility of the private and the public sectors, which are determined by (11) and (12), reduce to

$$\begin{aligned} X &= M^{\frac{1}{\rho}-1} \alpha \left(y - \frac{A_0}{r_G} \right) \frac{\rho}{c}, \text{ and} \\ G &= h \beta \left(y - \frac{A_0}{r_G} \right), \end{aligned} \quad (14)$$

respectively.

Moreover, expression (10) reduces to

$$M = (1 - \rho)\alpha r_X \left(\frac{y}{A_0} - \frac{1}{r_G} \right). \quad (15)$$

According to the model presented in Section 2, economic integration means that the size of each firm's consumer population rises from $r_X < \bar{R}$ to \bar{R} . And political integration increases state size from $r_G < \bar{R}$ to \bar{R} . The quality of the policy outcome depends on the time that voters have at their disposal for processing the political information received. According to (6), for $I = 1$, this time is restricted by the constraint

$$h = \min \{1, \tau_0 - M\}. \quad (16)$$

4.1 The case of the information-poor society

Let us first consider the effects of integration in an information-poor economy. In this case, $h = 1$. According to (15), a larger market size r_X increases the equilibrium diversity of product variants for private consumption. As shown by (14), this raises the utility that individuals draw from private consumption. In an information-poor society, individuals' exposure to a richer set of advertised private varieties does not distract their attention from political information. For $h = 1$, the quality of public policy and thus the utility drawn from the public sector are independent of r_X . Combining this with the gain in consumption utility, the conclusion must be that international goods market integration is beneficial. Political integration also is welfare enhancing. The reason is that a global government can distribute the cost of political information over a larger population of taxpayers. This increases

households' disposable income and augments both the utility drawn from the private sector and the utility provided by the public sector.

4.2 The case of the information-rich society

However, things change if the economy is information rich, that is, if the diversity of advertised private products exceeds the threshold $\tau_0 - 1$. As shown by (15), international integration itself may be responsible for making an economy information rich.

According to (6), in a society with a public sector, $M < \tau_0$. Otherwise we would have $hI = 0$.⁵ Moreover, in view of (16), $\tau_0 < M + 1$ if the society is information rich. In sum, we have

$$\tau_0 - 1 < M < \tau_0. \quad (17)$$

Combining (15) and $M + h = \tau_0$, we obtain for the quality of the public sector

$$h = \tau_0 - (1 - \rho)\alpha r_X \left(\frac{y}{A_0} - \frac{1}{r_G} \right). \quad (18)$$

International integration, by increasing the diversity of the range of private products, distracts individual attention from political information and thereby reduces the quality of the solutions provided to public problems. This confirms the fear that the agora is crowded out by the shopping mall. But does this diminish welfare?

Using (15) in X , we see that both economic and political integration are good for the utility derived from the private sector. In contrast, they have negative

⁵In this case, the competition of firms for consumer attention drives advertising cost A up to a point that brings M in line with attention capacity τ_0 . (See Falkinger, forthcoming, for an analysis of this case.)

effects on the utility derived from the public sector. Using (18) in G , we see that economic integration definitely reduces G , whereas the effect of political integration is ambiguous. The following proposition provides an answer to the question as to whether the deterioration of policy in a population distracted by the shopping mall is offset by the gains from trade, and whether political integration helps.

Proposition 1. *In an information-rich economy: (i) For a given r_G , economic integration increases welfare if and only if $\frac{\tau_0}{M} > 1 + \frac{\beta\rho}{\alpha(1-\rho)}$. (ii) For a given r_X , political integration increases welfare if and only if $\frac{\tau_0}{M} > 1 + \frac{\beta\rho}{\alpha(1-\rho)+\rho}$.*

Proof: Appendix B.

The right side of the inequality conditions derived in Proposition 1 is declining in α and $1/\rho$ and approaching one for $\alpha \rightarrow 1$ (i.e., $\beta \rightarrow 0$) as well as for $\rho \rightarrow 0$. Thus, the first conclusion is that, all else being equal, international integration is beneficial if both the weight of private consumption relative to public consumption and the preference for variety in private goods are high. Second, for given preference parameters, international integration is beneficial as long as the diversity of private consumption is not too great. For M close to τ_0 , the left side of the inequality conditions in Proposition 1 approaches one, so that integration is certainly harmful. According to (15), apart from preferences, M is high if the society is rich or large. Thus, the gains from globalisation are less certain in a rich or large society than in a small or poor economy. The intuition for the result is as follows. International integration increases the diversity of private consumption but also intensifies the

competition for attention since the scale economies of global information technologies can be exploited. This reduces the time dedicated to public issues and thus the quality of the public sector. Now, in an economy in which the diversity of private consumption is high anyway, a further increase in diversity through integration is not important enough so as to outweigh the cost of policy deterioration.

The comparison of Parts (i) and (ii) of Proposition 1 leads to a further important conclusion. Political integration (not accompanied by changes in economic integration) is more likely to increase welfare than is economic integration (not accompanied by political integration). Put the other way round, political integration can help to prevent the negative welfare effects of economic integration. For an economic intuition, it is useful to look at the reaction of taxes to international integration. Using (9) and (13), we obtain

$$\frac{g}{r_G} + t_0 = \beta y + \alpha \frac{A_0}{r_G}. \quad (19)$$

This shows an important difference between political and economic integration. Political integration reduces the government share in per-capita income because economies of scale in the distribution of political information are exploited. As we have seen, this has similar effects to economic integration: Diversity of private consumption rises and people's attention shifts away from political information, which lowers the quality of policy. But, in contrast to economic integration (not accompanied by political integration), the lower quality of policy comes with a leaner state and therefore hurts less. This result indicates that an interesting role is played by the government share. The analysis in the following section will evidence this role more clearly.

5 The impact of globalisation on the diversity of issues addressed by policy

Economic integration changes the diversity of products available to consumers. In an analogous way, political integration can have an effect on the diversity of political issues facing voters. We therefore now consider the case where I is endogenous, while h is fixed to one. Moreover, we assume that the percentage of income spent on political information is fixed. That is,

$$t_0 = ty \tag{20}$$

for some t , $0 < t < 1$. In the previous section, the important advantage of political over economic integration was that political integration reduced public spending. Assumption (20) eliminates this asymmetry. Substituting (20) into (9), we have

$$gI = r_G \beta (1 - t)y \tag{21}$$

and thus $gI/r_G + t_0 = [\beta + (1 - \beta)t]y$. Total public expenditure is proportional to the aggregate income of the population covered by the political system. As a consequence, the diversity of public goods is also proportional to the income and size of the population covered by policy. Using (20) in (5), we have

$$I = \frac{ty}{A} r_G. \tag{22}$$

In an analogous way, we have for the diversity of private consumption

$$M = \frac{(1 - \rho)\alpha(1 - t)y}{A} r_X. \tag{23}$$

(Using (20) in (10).)

Because of $h = 1$, the attention constraint now reads

$$M + I \leq \tau_0. \quad (24)$$

Finally, with (20), the expressions (11) and (12) for the utility derived from private and public consumption reduce to

$$\begin{aligned} X &= M^{\frac{1}{\rho}-1} \alpha (1-t) y \rho / c, \\ G &= I^{\frac{1}{\varphi}-1} \beta (1-t) y, \end{aligned} \quad (25)$$

respectively.

5.1 Information-poor societies

A society is information poor if there is no scarcity of attention. That is, people pay attention to all private or public goods advertised with strength A_0 . According to (22) and (23), this requires

$$\frac{(1-\rho)\alpha(1-t)y}{A_0} r_X + \frac{ty}{A_0} r_G \leq \tau_0. \quad (26)$$

If inequality (26) holds, then there is no competition for attention. No other firms want to enter the advertising space and advertise additional items. Nor are there free budgets for more political information. Thus, there is no upward pressure on advertising strength and information costs stay at A_0 per item. As a consequence, both economic and political integration increase diversity since the scale economies of global information can be exploited without crowding. According to (23), in a larger market, the shopping mall presents consumers with a richer set of varieties

to choose from. This increases the utility drawn from the private sector, as shown by (25). In the public sector, a larger population allows the promotion of a more diverse political agenda if people have free capacity for processing information. This increases the utility provided by the public sector because of the gains from diversity, as in the private sector. This optimistic view on international integration has to be qualified if inequality (26) does not hold, so that we are in an information-rich society. International integration - with global information on products and politics - is one important reason why attention capacity becomes binding. The others are economic wealth and progress in information technologies - reflected by y/A_0 in (26).

5.2 Information-rich societies

If inequality (26) does not hold, then competition for attention drives up advertising strength. Expenditure A , required to bring a good to the attention of the population, rises up to the point where the diversity of advertised goods is brought in line with perception constraint (24). In equilibrium, we have $M + I = \tau_0$, which implies that

$$\frac{A}{r_X} = \frac{yB}{\tau_0}, \quad \frac{A}{r_G} = \frac{yB}{\tau_0 r}, \quad (27)$$

where $B \equiv (1 - \rho)\alpha(1 - t) + tr$ and $r \equiv r_G/r_X$. We see that now the relative ranges of commercial and political information become crucial. Compared to autarky, where $r_X = r_G$ and thus $r = 1$, economic integration lowers r , whereas political integration raises it. As a consequence, according to (27), economic integration increases the per-capita cost of political information as compared with the information cost per consumer in the private sector. Political integration has the opposite effect. This reflects the fact that having a broader range of information distribution creates

an advantage in the competition for attention. This advantage carries over to the allocation of people's attention for consumption and politics. Using (27) in (22) and (23), we obtain

$$M = \frac{\tau_0}{1 + z(r)}, \quad I = \frac{\tau_0 z(r)}{1 + z(r)}, \quad (28)$$

with $z(r) \equiv \frac{t}{(1-\rho)\alpha(1-t)}r$.

This shows that economic integration (lowering r) increases the diversity of private consumption - and thus, according to (25), the utility drawn from the private sector - at the cost of a less diverse political agenda. This again confirms the view that the international shopping mall crowds out the national political agenda. However, for analogous reasons, political integration in economically isolated countries also has a crowding effect. The political agenda is enlarged at the cost of private consumption diversity. The following proposition presents the implications of international integration for people's welfare.

Proposition 2. *Let $r \equiv r_G/r_X$. In an information-rich society that spends a share t of income on political information, we have $dU/dr > 0$ if and only if $\frac{M}{I} > \frac{\alpha(1/\rho-1)}{\beta(1/\varphi-1)}$. At $r_X = r_G$, the latter condition is equivalent to $t < \frac{\beta(1-\varphi)\rho}{\beta(1-\varphi)\rho+\varphi} \equiv \bar{t}$.*

Proof. Appendix B.

This result points to a potential threat associated with globalisation which is exactly the opposite of what common sense might suggest. Political integration may be harmful, while economic integration without political integration can be a good thing. The reason is the following. Political integration involves the risk that an

abundant international political agenda distracts attention from the marketplace. Given a fixed budget share for information, the advantages of political information are used for promoting a more diverse political agenda. If people are not very keen on diversity in the public sector, this is wasteful. In contrast, economic integration generates more advertisements for private goods and reduces the diversity of public goods. At the same time, the expenditure allocated to any particular public good rises.⁶

The proposition shows that apart from preference parameters, the share of total income spent on political information matters. As long as this share is below the threshold \bar{t} , political integration is beneficial, while economic integration has a detrimental effect. Above this threshold, the welfare effects of political and economic integration are inverted. The relevant threshold is rising in ρ and falling in φ . That is, if the love for variety in private consumption is low or the love for variety in public goods is high, then, all else being equal, the budget share for political information can be high without risking harmful political integration. But if the love of variety in the public sector is low relative to the private sector, then, for a given t , the risk of harmful political integration is greater. For additional economic intuition, it is worth our while to look at the relative diversity of private and public goods. Proposition 2 shows that international integration is welfare increasing if it brings M/I into balance with the preference parameters. Apart from love of variety, the

⁶This can be seen by substituting (22) and (27) into (21), which yields $g = \frac{\beta(1-t)yB}{t\tau_0}r_X$. It is worth noting that this was different in the case considered in Section 4, where the size of the political agenda was fixed. According to (19), in that case $g = \beta(y-t_0)r_G + \alpha A_0$. Thus, g increases under political integration and is invariant to r_X .

weight of the private relative to the public sector in the people's utility function determines this balance. If the political agenda is rich as compared with private consumption diversity, then economic integration is required. If it is the other way round, political integration is recommended in order to strengthen the public sector in the competition for the people's scarce attention. What happens if economic and political integration take place *pari passu*? The answer is nothing as far as diversity and utility is concerned. Since r remains equal to one, full integration is neutral with respect to M and I , but also for X, G and U . The reason is that the gains from integration are completely absorbed by the intensified competition for attention. Obviously, this raises the question of what would be optimal from a planner's point of view.

5.3 Globalisation in an information-rich society without waste

If there is no wasteful competition for attention, then A is fixed at A_0 . Thus, in an information-rich society, in which $M + I = \tau_0$, the total information costs are $\tau_0 A_0$. Suppose that the feasible range of information distribution is $R \leq \bar{R}$ for both commercial and political information. The disposable income (after provision for information costs) is given by

$$y - \frac{\tau_0 A_0}{R} \equiv y^n. \quad (29)$$

The aggregate income constraint of the economy is

$$RcxM + gI = Ry^n \quad (30)$$

and the utility of the representative agent amounts to

$$U = M^{\frac{\alpha}{\rho}} x^{\alpha} I^{\frac{\beta}{\varphi}} (g/R)^{\beta}.$$

The following proposition characterises the optimal program of a planner maximising U – subject to income constraint (30) and attention constraint $I + M = \tau_0$.

Proposition 3. *In an information-rich society of size R : (i) A social planner chooses $M^* = \frac{\alpha(\frac{1}{\rho}-1)\tau_0}{\alpha(\frac{1}{\rho}-1)+\beta(\frac{1}{\varphi}-1)}$, $I^* = \tau_0 - M^*$ and $x^* = \frac{\alpha y^n}{cM^*}$, $g^* = \frac{\beta y^n R}{I^*}$. (ii) For $R < \bar{R}$, under the optimal program, welfare increases with R .*

Proof. Appendix.

This shows that also under conditions of scarcity of attention, economic and political integration are definitely a good thing if distortions from wasteful advertising are avoided. Diversity of private consumption relative to diversity of public goods is determined in such a way that people’s information-processing capacities are optimally brought in line with their preferences.⁷ And the gains from globalisation are used to increase private and public consumption quantities rather than being wasted in the competition for attention.⁸

6 Conclusion

This paper developed a two-sector equilibrium model with informative advertising about private and public goods. In equilibrium, the allocation of both the information-processing capacities and the economic resources in the private and the

⁷According to Part (i) of Proposition 3, M^* and I^* are invariant to changes in R .

⁸According to (29), net income rises with R . This in turn raises x^* and g^* , which increases welfare.

public sectors are determined simultaneously.

The utility derived from private consumption depends on the diversity of products available. Likewise the utility provided by the public sector is related to the diversity of public goods available. Moreover, the quality of policy can vary with the amount of time that voters have at their disposal for processing political information. The crucial assumption of the paper is that only items that are successfully brought to people's attention belong to their choice set, that is, the set of alternatives between which individuals decide as consumers and citizens. Modern information technologies and economic globalisation change the fundamentals of a society. Firms can address consumers globally using advertisements that provide everybody with knowledge about their products. This increases the exposure of people to information and may also increase the effort required from both economic and political agents to find a place on people's agendas. Does this lead to a predatory competition of commerce versus policy?

The analysis presented here provided the following answers. Whereas in an information-poor society – with no scarcity of attention – both economic and political integration are beneficial, there is indeed evidence of tension between intensified commercial advertising and political agendas in an information-rich world.

Section 4 considered the case of the size of the political agenda being fixed, but voters having more or less time for processing information about the political choices they face. Economic globalisation without international political integration biases the allocation of information capacities in favour of private consumption. This increases the diversity of the private goods consumed and reduces the quality of policy. As

a result, individuals lose as citizens and gain as consumers. However, on balance, they may gain nonetheless. Gains are less likely in a rich and large economy than in a small or poor economy. Political integration can also reduce welfare, though less likely than economic integration. In other words, accompanying economic integration with political integration is a good thing if integration is beneficial at all. The reason is that political integration allows exploitation of the scale effects of global information technologies and leads to a leaner state.

Section 5 considered the case of the diversity of the political agenda being endogenously adjusted, with the share of expenditure on political information relative to total income being held constant. In this case, under scarcity of attention, globalisation leads to wasteful advertising. As a consequence, either political or economic integration is beneficial, but never both. If the budget share for political information is below a certain threshold, then economic integration increases the diversity of private consumption at the cost of the diversity of the political agenda to such an extent that welfare declines. In this situation, political integration is recommended from a welfare point of view. If the budget share for political information is above the threshold, then political integration is harmful. The rich international political agenda crowds out the diversity of private consumption. Here, economic rather than political integration is recommended. Full integration is neutral, as far as diversity and welfare are concerned. All the gains of globalisation are wasted in the competition for people's attention. Under a social planner who avoids this waste, globalisation increases the quantities of private and public goods rather than their diversity. In this case, economic integration accompanied by political integration

then definitely also increases welfare in an information-rich world.

A Appendix

Household behaviour: The first-order conditions for $\max_{x_s, g_k} U$ are:

$$U_X X^{1-\rho} x_s^{\rho-1} - \lambda p_s = 0 \quad (\text{A1})$$

$$U_G G^{1-\varphi} g_k^{\varphi-1} (q r_G^{-\gamma})^\varphi - \lambda p_G = 0, \quad (\text{A2})$$

where $p_G \equiv 1/r_G$ and λ is the Lagrangean multiplier for the household's budget constraint. (Subscript notation is used for partial derivatives.)

Eliminating λ , we obtain from (A1), (A2)

$$\Gamma = \frac{G^\varphi g_k^{1-\varphi} p_G}{X^\rho x_s^{1-\rho} p_s} \left(\frac{r_G^\gamma}{q} \right)^\varphi, \quad (\text{A3})$$

with $\Gamma \equiv \frac{U_G G}{U_X X} = \frac{\beta}{\alpha}$.

Moreover, condition (A2) implies that $g_k = g_{k'} \equiv g$ for all k, k' so that

$$G = I^{\frac{1}{\varphi}} g q r_G^{-\gamma}. \quad (\text{A4})$$

Firm behaviour and free entry: According to (A1), consumer demand is isoelastic, so that each monopolist sets

$$p_s = \frac{c}{\rho} \equiv p_X \quad (\text{A5})$$

and $x_s = x$ for all s . Thus, the zero-profit condition $r_X(p_X - c)x = A$ implies

$$p_X x = \frac{1}{1-\rho} B_X \text{ with } B_X \equiv \frac{A}{r_X}. \quad (\text{A6})$$

Moreover, $X = M^{1/\rho} x$ becomes

$$X = M^{\frac{1}{\rho}} \frac{\rho}{(1-\rho)c} B_X \quad (\text{A7})$$

under free entry.

Equilibrium: Using (A4) - (A6) and $X = M^{\frac{1}{\rho}}x$ in (A3), we have

$$\Gamma = (1 - \rho) \frac{Igp_G}{MB_X}. \quad (\text{A8})$$

Moreover, with (A6), the household's budget constraint $Mp_Xx + Ip_Gg + t_0 = y$ reduces to

$$M \frac{B_X}{1 - \rho} + Ip_Gg = y - t_0. \quad (\text{A9})$$

Solving (A8) and (A9) for g and M , we obtain

$$g = \frac{y - t_0}{Ip_G} \frac{\Gamma}{1 + \Gamma} \quad (\text{A10})$$

$$M = \frac{(1 - \rho)(y - t_0)}{B_X} \frac{1}{1 + \Gamma}, \quad (\text{A11})$$

respectively.

In view of (A6) and (A11), the share of household income used for private consumption is given by

$$\frac{p_X Mx}{y} = \frac{y - t_0}{y} \frac{1}{1 + \Gamma}. \quad (\text{A12})$$

Moreover, using $p_G = 1/r_G$, (A10) and (A11) in (A4) and (A7), we have

$$G = I^{\frac{1}{\varphi} - 1} \frac{(y - t_0) \Gamma q r_G^{1 - \gamma}}{1 + \Gamma} \quad (\text{A13})$$

and

$$X = \frac{\rho}{c} \left(\frac{1 - \rho}{B_X} \right)^{\frac{1}{\rho} - 1} \left(\frac{y - t_0}{1 + \Gamma} \right)^{\frac{1}{\rho}}. \quad (\text{A14})$$

Finally, a balanced government budget requires

$$Ip_Gg + t_0 = I \frac{g}{r_G} + IB_G, \quad (\text{A15})$$

with $B_G \equiv A/r_G$. Since $p_G = 1/r_G$, this reduces to

$$IB_G = t_0. \tag{A16}$$

B Appendix

Proof of Proposition 1. Substituting (11), (A13), $I = 1$, $t_0 = A_0/r_G$ and $h = \tau_0 - M$ into $U(X, G)$, we have

$$U = \xi M^{\alpha(\frac{1}{\rho}-1)} (\tau_0 - M)^\beta \left(y - \frac{A_0}{r_G} \right), \quad (\text{B1})$$

with $\xi \equiv (\alpha\rho/c)^\alpha \beta^\beta r_G^{\beta(1-\gamma)}$.

(i) Since $\partial M/\partial r_X > 0$, $\frac{dU}{dr_X} \gtrless 0$ if and only if $\alpha \left(\frac{1}{\rho} - 1 \right) (\tau_0 - M) \gtrless \beta M$. This is equivalent to $\frac{\tau_0}{M} - 1 \gtrless \frac{\beta}{\alpha(\frac{1}{\rho}-1)}$, which can be rewritten in the form

$$\frac{\tau_0}{M} \gtrless 1 + \frac{\beta\rho}{\alpha(1-\rho)}. \quad (\text{B2})$$

(ii) For $\gamma = 1$, differentiation of (B1) with respect to r_G gives us the condition $\frac{dU}{dr_G} \gtrless 0$ if and only if $\left\{ \alpha \left(\frac{1}{\rho} - 1 \right) (\tau_0 - M) - \beta M \right\} \frac{\partial M}{\partial r_G} \left(y - \frac{A_0}{r_G} \right) + M(\tau_0 - M) \frac{A_0}{r_G^2} \gtrless 0$, where, according to (15), $\frac{\partial M}{\partial r_G} = (1-\rho)\alpha r_X \frac{1}{r_G^2}$. (If $\gamma < 1$, there is an additional positive effect $\beta(1-\gamma)U/r_G$.) Multiplying by r_G^2/A_0 and using $(1-\rho)\alpha r_X \left(\frac{y}{A_0} - \frac{1}{r_G} \right) = M$ from (15), we can rewrite the inequality condition in the form $\alpha \left(\frac{1}{\rho} - 1 \right) (\tau_0 - M) - \beta M + (\tau_0 - M) \gtrless 0$, which reduces to $\left(\frac{\tau_0}{M} - 1 \right) \left(\frac{\alpha(1-\rho)}{\rho} + 1 \right) \gtrless \beta$ or

$$\frac{\tau_0}{M} \gtrless 1 + \frac{\beta\rho}{\alpha(1-\rho) + \rho}. \quad (\text{B3})$$

QED.

Proof of Proposition 2. Substituting the expressions for X and G from (25) into U , we obtain

$$U = M^{\alpha(\frac{1}{\rho}-1)} I^{\beta(\frac{1}{\varphi}-1)} (1-t) y \left(\frac{\alpha\rho}{c} \right)^\alpha \beta^\beta.$$

With (28), this reduces to

$$U = \frac{z(r)^{\beta(\frac{1}{\varphi}-1)}}{[1+z(r)]^{\alpha(\frac{1}{\rho}-1)+\beta(\frac{1}{\varphi}-1)}} D,$$

with $D \equiv \tau_0^{\alpha(\frac{1}{\rho}-1)+\beta(\frac{1}{\varphi}-1)} (1-t) y \left(\frac{\alpha\rho}{c}\right)^\alpha \beta^\beta$.

Thus, $\frac{dU}{dr} \geq 0$ if and only if $\beta \left(\frac{1}{\varphi} - 1\right) (1+z) \geq \left[\alpha \left(\frac{1}{\rho} - 1\right) + \beta \left(\frac{1}{\varphi} - 1\right)\right] z$. (Note that $dz/dr > 0$.) This condition can be rewritten in the form

$$\beta \left(\frac{1}{\varphi} - 1\right) \geq \alpha \left(\frac{1}{\rho} - 1\right) z. \quad (\text{B4})$$

Next, apply $I/M = z(r)$ from (28). Then we can rewrite condition (B4) as $M/I \geq \frac{\alpha(1/\rho-1)}{\beta(1/\varphi-1)}$. This proves the first claim of the proposition.

For the second claim, note that, for $r_X = r_G$, $z = \frac{t}{(1-\rho)\alpha(1-t)}$ in (28). Substituting this into (B4) and rearranging the terms, we obtain the condition $\beta(1-\varphi)\rho(1-t) \geq \varphi t$, which reduces to $\bar{t} \geq t$. QED.

Proof of Proposition 3

Define $y_M \equiv cxM$ and $y_I \equiv gI/R$. Then constraint (30) can be rewritten as

$$y_M + y_I = y^n, \quad (\text{B5})$$

whereas U takes the form

$$U = M^{\alpha(\frac{1}{\rho}-1)} \frac{y_M^\alpha}{c^\alpha} I^{\beta(\frac{1}{\varphi}-1)} y_I^\beta. \quad (\text{B6})$$

Maximising (B6) subject to (B5) with respect to y_M, y_I , we obtain

$$y_M = \alpha y_n, \quad y_I = \beta y_n. \quad (\text{B7})$$

Furthermore, $\max_{M,I} U$ subject to the attention constraint $M + I = \tau_0$ gives us the first-order condition

$$\alpha \left(\frac{1}{\rho} - 1 \right) I = \beta \left(\frac{1}{\varphi} - 1 \right) M. \quad (\text{B8})$$

Combining (B8) with (B7) and using the definitions of y_M, y_I , we obtain the solutions for x, g, M and I presented in Part (i). For Part (ii), substitute the solutions into U and use (29) for y^n . Since y^n increases in R , U is also increasing in R . QED.

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