Abstract

In this paper I analyse the role of interactions between government policies, which is to say the impact that the adoption of one policy will have on the effects of another policy. In particular I consider the effect of such interactions on the market for policy whereby special interest groups aim to influence the policies adopted by politicians. The consideration of these types of policy interactions is an important point of departure from the bulk of political economy modelling where the market for one policy is analysed entirely separately from any other.

I find that a simple model of campaign contributions where a politician’s fixed policy position has ramifications for the returns that special interests see from a pliable policy that they can influence, can help explain the different policies adopted by political parties and the relative success of both the political parties and of the special interests.

This structure for a political market is applied to a simple Heckscher-
Ohlin type model of international trade where the political parties take a fixed position on an income tax, and special interests attempt to influence the trade policy position of the parties. I show that an income tax does affect the returns that special interests see from a change in trade policy, and this will cause such interest groups to treat high and low tax parties in a different way, even if the parties are assumed to have no particular bias towards any trade policy position.

Trade policy differences between political parties are therefore endogenously determined, based on the party’s position on income tax levels. In particular a pro-tariff group, when representing poorer, relatively labour abundant individuals, can be shown to gain a relatively larger benefit from the high income tax party. They will therefore dedicate more effort to influencing them, and lead to the high income tax party also adopting a more protective trade policy.
1 Introduction

This paper follows others such as Grossman and Helpman (1994) and Baron (1994) in treating government policy determination as the result of strategic interactions that can be treated in much the same way as an economic marketplace. Politicians are viewed as the suppliers of policy, with voters, some of whom may be organised into special interest groups (SIGs) as the consumers. The original aspect of this paper is that I analyse the effect that interactions with the other elements of a politicians policy package can have on these political markets. By interactions I mean the possibility that the returns a citizen sees to the adoption of one particular policy, may be affected by the other policies that are part of the politicians overall package. Therefore (to use an example analysed later in this paper) the returns from trade protection may differ, depending on the other economic policies that are also being proposed by that politician. This in turn will mean that demand for specific policy changes from interested individuals and groups, will be affected, with a variety of consequences for the outcomes from the political process.

Such demand-side interactions between policies seem likely to be important in explaining some political behaviour, particularly that of SIGs who can wield considerable resources and are generally better informed on policy issues than the average voter. The existing literature tends to treat the demand for policy by SIGs as identical for different politicians, irrespective of the fact that the other policies proposed by a politician, particularly economic ones, are likely to affect the outcome from the SIGs’ perspective. In effect therefore the approach
of this paper is to treat demand for the policy favours of a particular politician as endogenous, because different politicians or political parties have different policies that will be enacted along with the policy or policies that a particular voter or group of voters organised as a SIG, care about.

The approach of this paper is to follow authors such as Baron (1994) and Grossman and Helpman (1996) who model each political party as having some set of exogenous fixed policies (for reasons of ideology, strong core voter preference etc.) as well as a number of pliable policies (to borrow Baron’s phrase) that they will change in order to gain an electoral advantage, including the possibility of pleasing SIGs in order to attract campaign finance. The implicit assumption in their analysis of the political market for the pliable policies is that the effects of these policies on the SIG’s welfare will be the same whichever candidate wins, and hence whichever set of policies, fixed and pliable, is then adopted after the election. Hence the demand for a pliable policy is assumed independent of whom the winning politician is, and what their other policies are. In this paper I consider how differences in the other policies of a party can affect the returns and hence demand in a political market.

The model developed here shows us that a positive interaction, that is where the fixed policies of a party cause a SIG to see a higher return to any improve-

1A simplifying assumption of the model developed in the next section is that only the fixed policies impact on the returns of the pliable policies. It could of course be the case that there are interactions between all pliable policies. This would result in a rather complicated model so I consider the simpler case in order to better focus on the main results.

It also seems reasonable to consider that the fixed policies (which in the terms of this model simply means that special interests have no bearing on them) are likely to have a stronger impact on other policies, as it is fixed policies that are likely to be those having a large impact on the economy and society, hence more prone to determination due to ideological leanings and voter preference.
ment in the pliable policy position (relative to that caused by the fixed policy platform of the other party) will mean that more money is spent attempting to influence that politician by all special interests and that this will mean an improvement in the policy position, from the perspective of the SIG experiencing the positive interaction. Therefore those special interests whose goals are better helped by the other successfully adopted policies will achieve a greater level of welfare. We therefore see that different political parties will propose different pliable policies due to these interaction effects. With each party having a different set of policies and special interests realising different returns, the parties have an incentive to favour special interests who benefit most from that party’s other policies. As these are different for each party we will see a divergence in the parties policy announcements.

I apply the policy interaction idea to a model based on that of Becker (1983) in which two SIGs with opposing interests compete to influence politicians, but the idea could be applied to many models of political markets where differences in the proposed policy platforms of rival politicians can have important implications for the outcomes of the political market. In the final part of this paper I apply the idea of policy interactions to a model of trade policy to show how differences in income tax rates can affect the returns to trade protection for the owners of different relative amounts of the factors of production.

How the differences between politicians affects political markets is a question that has been considered by several authors, but the focus of these other works is entirely on the supply-side of the market, that is how such differences affect the
ability or willingness of politicians to supply policy favours to voters and SIGs. This differs to the demand-side effects generated by differences in politicians in this model. Examples of this strand of literature include Coate and Morris (1995) who makes the assumption of a "good" and a "bad" politician who behave differently, Grier and Munger (1991) consider the role of committee assignments for US politicians, with those in important roles on committees being able to effectively supply policy favours at a lower price. A similar idea is found in Snyder (1990) who posits that seniority, experience etc. will affect the amount of policy favours a politician is able to offer. Dixit and Londregan (1996) and Stratman (1992) both consider politicians with constituency interests or certain expertise who can deliver policy favours more efficiently or cheaply to these groups. So fundamental differences in politicians is something that has been analysed several times, how policy differences affect the demand for policy favours has not been.

An important aspect of the model developed in the following sections is the lack of an explicit role for voters in the political decision making process. In this I follow authors such as Hillman and Ursprung (1988) who assume that political success is determined by campaign contributions rather than policies that appeal to voters. My principal reasoning is the desire to focus upon the dynamics of policy interactions on special interests and consequently the money they spend and the resulting electoral outcome. The importance of special interests is reliant on the fact that at least some voters are uninformed in some way concerning the election. This provides the politicians with the motivation
to raise money from lobbyists so as to convince these uninformed voters to support them at the ballot box as with Baron (1994). The politician/party that has the highest level of contributions and therefore campaign spending is more likely to win the election. Whilst some authors (McKelvey and Ordeshook, 1986) would contest that a lack of information on the issues is necessarily an impediment to making a rational decision at the ballot box there is evidence that voters are uninformed on a large number of issues, particularly the "pliable" issues that are most likely to be manipulated by special interests (in that their benefits are focused on a limited segment of the population, whereas the costs are dispersed)\(^2\).

The issue of trade policy analysed later in the paper provides a good example of a policy on which many people have little awareness and/or understanding. For example Topalova (2004) finds from an analysis of Indian trade liberalisation that there was little popular interest in trade policy amongst voters. Similarly Bloningen (2008) analyses US survey data and finds that 30% of those surveyed felt that they did not have enough information to form an opinion about trade policy. Finally Conybeare (1991) points out there is often little resistance to protection for local industry because most of the costs are born in other areas. However there will be a range of economically important domestic issues that are part of a politicians platform, which many voters will care about and understand and which will, crucially, feedback to effect the demand for trade protection. Tullock (1972) makes the point that special interests are unlikely to wield such

---

\(^2\)Evidence that campaign contributions have the greatest influence on policy proposals when the issue has low public visibility is provided by Schroedel (1986) amongst others.
significant power in areas of major policy issues and much more likely in areas
where there are small private benefits.

In the next section I outline the basic model of political economy, showing
that an inclusion of interactions between policies can have results for the policies
proposed by politicians, and the welfare of the special interests who make up
the demand side of the political market. I then develop an application of this
structure to the market for trade protection to show that the effects of differences
in the economic policies of parties, in terms of their proposed income tax rate,
has implications for the returns to trade protection and hence the equilibrium
structure of policy.

2 The Model

I begin by outlining a simple model of a political market based on the model by
Becker (1983). This model sees two special interest groups (SIGs) competing
for policy favours from politicians in the manner of an oligopoly in a more
traditional economics setting. The SIGs’ members are assumed to be united
around their common interest concerning just one of the parties pliable policies
(members of the group may have diverse opinions on the other policies on offer).
The groups $i = 1, 2$ have total utility (encompassing all their members) functions
as follows:

$$ W^i = w^i(p, F) $$  \hspace{1cm} (1) 

Where $p$ is the pliable policy over which the SIGs have influence and $F$
represents the fixed policy of the political party\(^3\). The fixed policy platform is the source of the demand-side interactions this paper analyses. For the sake of argument I will assume for the remainder of the analysis that in the region of the equilibrium, the two SIGs have opposing interests, that is, what is good for one group, will be bad for the other group. Group 1 is assumed to be the group benefitting from an increase in \(p\), group 2 the group that benefits from a decrease in \(p\), such that \(w_p^1 > 0\) and \(w_p^2 < 0\), where subscripts denote derivatives.

Utility is assumed to be strictly concave in the pliable policy for both groups. The role of the fixed policy in the utility function will be discussed later in the analysis.

The level of the pliable policy is determined by the influence placed on the politician by the two SIGs.

\[
p = I^1(q^1, q^2, x^1) = -I^2(q^1, q^2, x^2) \tag{2}
\]

Where \(q^i\) is the pressure produced by group \(i\), and \(x^i\) represents some set of other variables that may affect the influence group \(i\) brings to bear on the politician. An increase in pressure will always have a non-negative effect on the influence a SIG has, and hence the level of the pliable policy they receive; \(I^i_{q^i} \geq 0\). Both groups face the same policy and so their levels of influence must

\(^3\)I will talk for the rest of this paper as if both the fixed and pliable policies are defined so that an increase or decrease in the policy has some meaning. For economic policies such as the taxes and tariffs used in the applied example for this paper this is clearly the case. For other policies this may not be so clear, but many debates remained defined in those favouring more or less of something, for example prison sentencing or drugs legislation. Either way the principle of the paper that a politician’s other policies matter to the value an interested party places on a specific policy, will apply.
be balanced, an increase in influence of one group that moves the policy in their favour must be matched by a decrease in the influence of the other group. This means that for any variable $y$ it must be the case that $I^1_y = -I^2_y$. I also assume that $I^1_{q^1} q^2 = I^2_{q^2} q^1 = 0$ that is there is no effect of one SIGs pressure on the marginal impact of the other SIGs pressure$^4$.

In this specification the political system is radically simplified so that the focus is on the motivations and actions of the SIGs, as is useful to me for my study of demand side effects of policy interactions. Pressure is produced by a SIG spending its resources in the following manner:

$$q^i = q^i(m^i, n^i)$$

Where $m^i = c^i n^i$ represents the total resources directed at influencing the pliable policy of the politician by SIG $i$, with the number of members of the group being denoted $n^i$ and the spending per member being $c^i$. This spending could be for lobbying efforts, direct campaigning on behalf of the candidate, or for monetary contributions to the party’s election campaign, amongst other reasons. I assume that $q^i_{m^i} \geq 0$, more resources put into the political process will never have a negative effect on the production of pressure$^5$. The spending per

$^4$Becker makes much of the 'substitutability' (increased pressure by the other SIG reduces the marginal impact of a SIG’s pressure) or 'complementarity' (increased pressure by the other SIG increases the marginal impact of our SIG’s pressure) in the influence functions in his analysis, without offering much intuition as to what features of the political system would lead to these results. Because of this, and for reasons of simplicity, I assume these ideas away.

$^5$There is mixed evidence on whether political campaigning actually brings any benefit to special interests, and where there is evidence of a positive effect, the strength and form of that benefit can also be contentious. For example Loomis and Sexton (1995) suggest that much PAC spending (Political Action Committees - one of the main channels for channeling campaign contributions in the USA) is wasted and Stratmann (2009) makes reference to the number of studies finding that political spending is ineffective. Stratmann helps explain this
member, \( c^i \) is the only choice variable in this model, and must take a positive finite value. When factoring it into the total group utility function of equation 1 in a linear manner we have:

\[
W^i = w^i(p, F) - n^i c^i
\]  

(4)

This utility will be maximised when the following condition holds:

\[
\frac{dw^i}{dc^i} \frac{1}{n^i} = 1
\]  

(5)

I follow Becker in making the simplifying assumption that each group takes the other’s actions as given when deciding how much pressure to produce in order to derive a non cooperative Cournot-Nash equilibrium. This leads, using the equations 2, 3, 4 and 5 to the following specification of the marginal effect of spending resources on political pressure in equilibrium for group’s 1 and 2 respectively:

\[
\frac{dw^1}{dc^1} = \frac{\partial w^1}{\partial p} \frac{\partial I^1}{\partial q^1} \frac{\partial q^1}{\partial m^1} = 1
\]  

(6)

\[
\frac{dw^2}{dc^2} = -\frac{\partial w^2}{\partial p} \frac{\partial I^2}{\partial q^2} \frac{\partial q^2}{\partial m^2} = 1
\]  

(7)

These conditions can be solved for equilibrium values of \( c^1 \) and \( c^2 \) and hence of political pressure \( q^1 \) and \( q^2 \). Sufficient conditions for equation 6 to represent utility maximising levels of \( c^1 \) are that \( I_{qq}, q_{mm} \) and \( w_{pp} \) are all negative and for

puzzle in the area of advertising by accounting for differences in advertising prices. At a minimum it seems clear with the amount of money going into politics in many countries that SIGs at least believe that their effort has some reward.
equation 7 to give utility maximising levels of $c^2$, that $q_{mm}$ and $I_{qq}$ are negative and that $w_{pp}$ is positive$^6$.

As this political market is comparable to an oligopoly we can discuss the reaction functions of the two SIGs, as Becker does in his original paper. In particular it is important to establish the slopes of the reaction functions. I follow Becker in establishing that (given the assumptions about functional forms already made) reaction functions are upward sloping, an increase in spending and pressure by one SIG, will be matched by increased spending and pressure by the other SIG also$^7$. Stability of the equilibrium is assured by following Becker in assuming that group 1’s reaction function is steeper than group 2’s as depicted in Figure 1:

FIGURE 1: Reaction functions for groups 1 and 2

$^6$Full details of these conditions are contained in the appendix.
$^7$Proof of this is in the appendix
With reaction functions as depicted here, any deviation from the equilibrium will be self-correcting\(^8\).

So far I have followed Becker in discussing the political process in terms of two SIGs attempting to influence a single political entity. I now wish to extend this to include an election which will be the setting for the analysis of policy interactions. There are two parties (party A and party B) contesting for political power. Both SIGs perceive the same probabilities \(\theta^A\) and \(\theta^B\) of the respective parties winning the election\(^9\). Expected utility for a SIG is therefore:

\[
EW^i = \theta^A w^A(p^A, F^A) + \theta^B w^B(p^A, F^A) - c^A - c^B
\]  

(8)

The SIGs are engaged in influencing the proposed pliable policies of the two parties, spending per member is a sunk cost to realise a potential gain if that party is first elected, and then implements their policy platform\(^10\). The maximisation condition in the market for a particular parties policies, from

---

\(^8\) An assumption about relative reaction curve slopes is common in order to ensure stability, as is done in the Becker paper on which this section is based. Proof of the relevant conditions is beyond the scope of this paper.

\(^9\) This follows other papers including Baron (1994) and Austen-Smith (1995) who both take the parties probabilities of being elected as exogenous. The special interests do however perceive the possibility of changing the policy offered to better suit them. The special interests are therefore focussed on an influence motive for giving rather than an electoral motive (Grossman and Helpman, 1996).

The evidence on whether special interests do in fact pursue an influence or an electoral motive is mixed. For example Magee (2002) finds that there is little evidence for an influence motive, whereas Strattman (1992) finds evidence for both an influence and an electoral motive. In any case which motive is dominant is not vital to the key message of this paper which is the importance of interactions between policies. If we were to dismiss the influence motive and focus on an electoral one it would still be perfectly feasible to consider demand-side interactions between policies.

\(^10\) I assume that all promises are honoured in terms of the special interests paying their promised amounts and the politicians adopting the policies they say they will.
equations 6 and 8, now becomes for group 1:

\[
\frac{dw^i}{dc^i} = \theta_i \partial w^i \frac{\partial I^i}{\partial p} \frac{\partial q^i}{\partial m^i} = 1
\]

(9)

With a similar condition for group 2 based on equation 7. I assume that the fixed policy platforms of the two parties are different for the remainder of the analysis; \(F^A \neq F^B\).

2.1 **The role of policy interactions**

I will now discuss how policy interactions affect the equilibrium of this model. The key original feature of this model is the interaction between the parties set of fixed policies and the returns that the special interests receive from the pliable policy. Whilst other papers assume that the same policy delivers the same returns regardless of who wins the election, I will explore the impact of policy interactions where the adoption of one policy systematically affects the return to another policy. From the perspective of the SIGs the two parties offer different 'products' due to their differences in fixed policies and the effect this has on the returns to the pliable policies. Examples of such interactions can easily be imagined. Lobbying to gain support for public investment in your industry may be more rewarding when directed to a party that is also promising to reduce the sales tax on the goods that you manufacture. Similarly gaining support for the approval of new prescription drugs may see a bigger payoff from a party promising to spend more on healthcare.
The markets for the two parties pliable policy positions can be treated entirely separately due to the assumption that electoral probabilities are taken as given. The role of the fixed policy is described as follows (the specification being influenced by Grier and Munger, 1991). Generally I assume that for two differing fixed policies $F^A \neq F^B$ then:

\[ W = w(p, F^A) \geq w(p, F^B) \]  \hspace{1cm} (10)

Also (and more importantly) I assume that:

\[ \frac{d}{dF} \left( \frac{\partial w^i}{\partial p} \right) \leq 0 \]  \hspace{1cm} (11)

Therefore the fixed policy programme of the political party is assumed to affect both the level of utility that a SIG acquires from some given level of the pliable policy, and the marginal rate at which utility changes as the pliable policy changes. I shall discuss more specific examples of what the differences will be, and their effects, later in the analysis.

How does this interaction with the parties platform of fixed policies affect the equilibrium discussed in the previous section? Clearly equation 11 showing the assumption of an effect on the marginal utility of a pliable policy change will affect equation 9 which is the equilibrium condition for this model. Let us consider a scenario where the fixed policy has no effect on the returns from the pliable policy for SIG 2 such that $w^2(p, F^A) = w^2(p, F^B)$ and $(\frac{\partial w^2}{\partial p}) = (\frac{\partial w^2}{\partial p})$ but for SIG 1 their is a positive interaction with the fixed policy platform of
party A such that \( w^1(p, F^A) > w^1(p, F^B) \) and \( \left( \frac{\partial w^1_i}{\partial p} \right) > \left( \frac{\partial w^1_i}{\partial p} \right) \). What will the effects be when we compare the political equilibriums of the two parties?

From equation 9 we see that if \( \frac{\partial w^i}{\partial p} \) is larger for any given policy, as we are suggesting is the case for SIG 1’s relations with party A in this scenario, then to fulfill the equilibrium condition that the marginal benefit of political spending is equal to the marginal cost then it must be the case that SIG 1 will spend comparatively more money in producing political pressure in the market for party A’s proposed pliable policy platform\(^{11}\).

**Proposition 1** A positive interaction (higher marginal return to an improved pliable policy position) with a parties fixed policy will lead a SIG to spend more money trying to influence that party’s policies compared to a party that generates no such positive interaction.

**Corollary 2** When reaction functions are upward sloping it is in fact the case that both SIGs will spend more money influencing the policy platform of a party whose fixed policies have a positive effect on the returns to a favourable pliable policy, even if this effect is only generated for one of the SIGs.

When both SIGs are spending more money to influence the political process we need to say something about the way in which equilibrium policy may be influenced.

**Proposition 3** The SIG that spends more money influencing a politician due to the positive effect their fixed policy has on the returns to the pliable policy

\(^{11}\)Proofs for the Propositions are contained in the appendix.
proposal, will get a more favourable proposed policy.

These results create two more interesting implications. Firstly that parties who are identical in every other way, facing the same two SIGs’ attempts to influence their pliable policy platforms, will in fact propose different policies in equilibrium. This result is important because it gives an alternative reason for why political parties deviate from choosing the same policy. A simple spatial voting model will in equilibrium have both political parties locating at the median voter’s optimal policy, and whilst it is often true that parties do locate somewhere near the median, they are rarely identical and can often diverge in an extreme manner.

Secondly a party that has fixed policies that create larger returns to the pliable policies that are influenced by interest groups, will see a greater amount of effort to influence them by both sides. To the extent that the effort of SIGs includes campaign contributions, this could give such a party an advantage in an election (though of course we take electoral probabilities as a given here, an extension to consider their endogeneity in this context would prove interesting).

So we see that a positive interaction due to a favourable fixed policy platform induces a SIG to spend more money, and even though their rival will also be induced to spend more money when reaction functions are upward sloping, that SIG will get a better policy. Clearly if both SIGs get an increased marginal welfare from one parties fixed policy platform compared to the other, then certainly even more money will be spent, and which SIG gets the better policy (relative to their being no role for policy interactions) will be less clear, coming
down to which SIG sees the larger benefit from the interaction. All these results follow fairly simply from the specification of the impact that differences in the fixed policy will have on the marginal returns to a change in the pliable policy. As we will see in the next section however it is fairly easy to generate such effects in economic models, and that these can have important consequences on equilibrium policies.

What might be the relationship between the fixed policy interactions of the two SIGs with opposite interests in reality? It seems unreasonable to think that all groups with an interest on the same issue will necessarily see their returns to changes in the pliable policy be affected by the fixed policies in the same way, but it remains a possibility. An example of this may be that parties who are generally 'pro-business' in outlook are likely to have policies that create positive interactions for businesses. So on an issue where there are businesses with opposite interests, firms on both sides of the issue may still perceive a higher return to getting the policy change they desire and will be more willing to contribute to the pro-business party. On the other hand an issue may be one where the businesses tend to be grouped against labour unions. In this case the pro-business party may generate higher returns for businesses. Whilst a pro-labour party may generate higher returns for unions. So in this case it is less clear which party is likely to be more successful. This idea is supported by Conway and Green (1995) who find that PACs representing business interests consider a candidates "attitude to business" the key determinant to their contributions.
3 An Application to Trade policy

In this section I will apply the model of political competition with policy interactions developed in the last section to a model of trade policy so as to highlight the role that my analysis of interactions can play. The application is to the Heckscher-Ohlin (H-O) trade model, and in particular the version from Mayer (2002) that considers the role of both tariffs and an income tax. This is clearly appealing as a model that the analysis from the previous section can be applied to. The income tax will be taken as the fixed policy platform and the tariff as the pliable policy of two political parties. Following the discussion in the introduction this assignment of the two policies fits to the logic of fixed (or at least less flexible policies) being those whose costs and benefits affect large segments of the population in a substantial way, whereas pliable policies tend to have concentrated benefits and diffuse costs, and are thus more susceptible to manipulation by SIGs.

In terms of the differences in fixed policies platforms the two parties are assumed to adopt broadly left and right-wing (economic) stances for their fixed policies. That is two say one party (the left) will have higher income taxes and the other (the right) lower taxes. This will be shown to have implications for the trade policy adopted by the two parties, even though both parties are willing to change their policies in a similar manner, and both face the same economic interests in favour of, and opposed to trade protection.
3.1 The Trade Model

The model follows a standard H-O format, with two factors of production, and two goods. Factors are perfectly mobile within a country but immobile internationally. Factor and product markets are perfectly competitive, and we assume the country of consideration is a small open economy (SOE) such that world prices for goods are a given and for further simplification are equal to one. Sector 1 is assumed to be the export sector and sector 2 the import sector. Individuals preferences for private goods are assumed to be homothetic and identical and indirect utility for individual $i$ takes the form:

$$W^i = w(p^d, Y^i)$$  \hspace{1cm} (12)

Where $p^d = (p^{d1}, p^{d2})$ represents the vector of domestic prices faced by consumers in sectors 1 and 2, and $Y^i = (1 - t)I^i$ is after-tax income, with $t$ as the income tax rate and $I^i$ as factor income. The $w(\cdot)$ function is continuous and concave in both arguments, with increasing income having a strictly positive effect and increasing prices having a non-positive effect on utility\textsuperscript{12}. Individuals

\textsuperscript{12}In the Mayer model, tariff and income tax revenue is used to fund public good provision, and this is part of the utility function of the citizens, affecting their preference for the use of the different instruments. Here I have omitted a discussion of the revenue and spending effects of the tariff, and their impact on the utility of the citizens. The justification for this is two-fold.

Firstly I have assumed (as do many other models of special interest group activity) that the SIGs in the model of political competition are organised around a single goal. The individual members of a SIG may care about other policies in different ways. Therefore to assume that the SIGs only care about the effect of the tariff on their (real) private income seems to fit best to this assumption. It also seems more reasonable if we are considering a more developed, capital-rich country as we are here, in developed countries tariff revenue tends to be an insignificant part of overall revenue and is unlikely to be a major concern for either pro or anti trade protection groups. Evidence to support this contention comes from Hanson et al (2007) who find that in the USA at least, public finance concerns do not affect voters attitudes towards trade policy. The authors claiming that this is consistent with US trade
differ in factor ownership, and therefore in their factor income. All individuals are assumed to own one unit of labour, but differ in their ownership of capital. Factor income is represented by:

\[ I_i(p^s, K_i) = l(p^s) + r(p^s)K_i \]  \hspace{1cm} (13)

Where \( l \) is the wage rate, \( r \) is rental rate and \( K_i \) is individual \( i \)'s amount of capital, \( p^s = (p^s_1, p^s_2) \) is the vector of prices faced by domestic producers.

Following Mayer we restate this factor income in the following manner:

\[ I^i(p^s, K^i) = \phi^i(p^s, K^i)I(p^s) \]  \hspace{1cm} (14)

Where \( I(\cdot) \) is national income and \( \phi^i(\cdot) \) is individual \( i \)'s capital ownership share. The \( \phi^i(\cdot) \) function is assumed to be strictly increasing in an individual's ownership of capital and will respond to price changes in a manner determined by the individuals relative factor ownership. This share is the crucial determinant of an individual’s preferences over the tariff. Assuming that we are analysing a relatively capital abundant country (such that the export good from sector 1 is produced in a capital-intensive manner, and the import good of sector 2 is produced in a labour-intensive manner) then following the Stolper-Policy have a negligible fiscal policy impact. Of course in many developing countries revenue from trade policy instruments often does make up a large portion of revenue. Therefore this model may need adapting to include tariff revenue more prominently if it is to be applied to such countries.

Secondly, and related to the previous point, is the fact that the fiscal impact of the tariff (and the effect of the income tax upon it) would be the same for members of both groups, and what we are interested in is the differences between the groups, therefore introducing such fiscal concerns would only complicate the analysis whilst adding little of interest.
Samuelson result relatively capital rich individuals will see their income fall as a result of an increase in the relative price of the labour intensive good, whereas relatively labour rich individuals will see their incomes rise. Finally I assume that the \( \phi^i(\cdot) \) function is strictly concave in both its arguments. The effect of the tariff on imports of good 2 is as follows:

\[
p^d_2 = p^*_2 = 1 + \tau
\]  

(15)

Clearly the effect of the tariff is to increase the price of imports of the labour intensive good 2. This means that relatively capital rich individuals will oppose a tariff, relatively labour rich individuals will support a tariff. This therefore is the set up for our two opposing SIGs that we saw in the political economy model developed earlier.

### 3.2 The Effect of Policy Interactions

The key variable from the earlier analysis of political equilibrium is \( \frac{\partial w^i}{\partial p^i} \) the marginal utility of a change in the pliable policy, this is assumed to be affected by the fixed policy, thus leading to the results discussed in the previous section. The pliable policy here is the tariff, so we must show how changes in the tariff affect utility in this trade model. The effect of changes in tariffs on utility is given by:

\[
\frac{\partial W^i}{\partial \tau} = w_{Y,i}(\cdot) \left[ -\phi^i(\cdot)M(\cdot) - \phi^i(\cdot)X_2(\cdot)t + Y \frac{\partial \phi^i(\cdot)}{\partial p^*_2} \right]
\]

(16)
The derivation of this expression follows Mayer in using Roy’s identity and the assumption that agent’s preferences are identical and homothetic, implying that 

\[ \frac{U_p}{U_Y} = -\phi D_2 \]

where \( D_2 = X_2 + M \) is the total demand for good 2 with \( X_2 \) being domestic production of good 2, and \( M \) representing imports of good 2. The national after-tax income is expressed as \( Y = (1 - t)I(p^s) \). Equation 16 is therefore the equivalent of \( \frac{\partial W_i}{\partial p} \) in the political model, it tells us the change in an individual’s welfare due to a change in the pliable policy. We can note immediately that \( \frac{\partial W_i}{\partial t} \) is a function of the income tax rate, and therefore differences in this fixed policy will have an effect in the political market for tariffs, therefore meaning that the political model of policy interactions developed earlier in the paper, is applicable here.

Whilst the marginal utility of an income change \( (w_Y) \), and the share of national income \( (\phi) \) will differ from one individual to the next, they will still have the same sign, it is the expression for the change in income share; \( \frac{\partial \phi}{\partial p} \) that has a different sign for different groups, and which distinguishes the differences in the two SIGs. For those owning a relatively large share of the abundant factor (capital in this case) the sign of this term is negative, for those relatively richly endowed in labour it is positive. Both groups lose out as consumers due to the increased price of the good, but only the labour rich may gain overall due to an increase in income share. For the relatively capital-rich, equation 16 is certainly negative. To make the analysis clearer and to fit in with the assumptions of the political model that the interests of the two SIGs are diametrically opposed I shall assume from now on that it is in fact the case that for those relatively
labour-rich people who are members of the SIG representing their interests, that are interested in a reduction in tariffs, and the labour-rich will be willing to pay money to get politicians to enact a higher tariff rate.

An important assumption for ensuring a unique equilibrium of the political model was that utility for the SIG was strictly concave in the pliable policy, so we must show that the condition in equation 16 can be concave, this is discussed in the appendix. I now envisage a scenario where there are two political parties competing in an election. As part of their policy package both parties propose differing income tax rates, let party $L$ propose the tax rate $t^L$ and party $R$ the rate $t^R$ where $t^L > t^R$. What will be the effect of this on the market for trade protection that the capital and labour rich SIGs are engaged in? As shown earlier to understand the effect of the interaction with the fixed policy, we must analyse its effect on the marginal utility of the pliable policy change, in this case, equation 16. The

13 For the analysis to be applicable, it is only required that the two SIGs have opposing views (in terms of the direction of policy change) across some range of values for the pliable policy. It is perfectly possible that for some values, both would agree on an increase or reduction in the value of the pliable policy.

14 Mayer simply assumes that utility is strictly concave in both tax instruments, in the appendix I go into some more detail about the conditions under which this is true. For the remainder of this analysis it is assumed that this condition is met, and that SIG utility is concave in the tariff, so as to ensure a unique political equilibrium, as discussed earlier in the paper.
The marginal effect of changes in the income tax rate on equation 16 is given by:

\[
\frac{\partial^2 W^t}{\partial t \partial \tau} = -w_{Y',Y} (\cdot) I^t \left[ -\phi^t(\cdot) M(\cdot) - \phi^t(\cdot) X_2(\cdot) t + Y \frac{\partial \phi^t(\cdot)}{\partial p^2} \right] + w_{Y^t} (\cdot) \left[ -\phi^t(\cdot) M_t (\cdot) - \phi^t(\cdot) X_2(\cdot) - I \frac{\partial \phi^t(\cdot)}{\partial p^2} \right]
\]

(17)

For the labour rich the first square-bracketed term is positive by assumption (see discussion of equation 16 above), concavity of the \( w(\cdot) \) function means \( w_{Y',Y} (\cdot) \) is negative, therefore the whole first term is positive, the marginal utility from the extra income accrued from a higher tariff increases as higher income tax reduces real income. However the second square-bracketed term representing the change in the marginal income effect of the tariff due to an increase in the income tax rate, will be negative unless the \( -\phi^t(\cdot) M_t (\cdot) \) term is positive (representing the smaller loss as a consumer due to higher prices, because a higher income tax means less goods are consumed) is sufficiently large. The marginal utility of an income rise \( (w_{Y^t} (\cdot)) \) is positive therefore the second term is possibly negative. Therefore there are two competing effects on the marginal benefit of a tariff for a labour-rich individual, when income tax rates are higher. The marginal utility of the extra income is higher as the income tax reduces income (and the utility function is strictly concave), but the value of the actual income increase is reduced. Exactly the same logic can be applied for the relatively capital rich individuals. The marginal utility of a tariff reduction is enhanced by a higher income tax rate which reduces nominal income. But also the amount of extra income due to a beneficial tariff change
is reduced by a higher income tax.

The effect on political equilibrium in this case then depends on which of these effects, the effect on the actual income change, or the effect on the marginal utility of the income change, is larger. What is worth noting here is that in this model, the relatively labour rich, are poorer than the relatively capital rich as we assume all individuals have the same amount of labour and only differ in their capital endowment. This means that the income tax effect of increasing marginal utility of a given tariff induced income improvement will be larger for the tariff supporting group. This means it is the relatively labour rich who will see a larger marginal utility from a positive pliable policy change due to a higher income tax.

What this means is that party $L$ who are proposing a higher income tax rate will create a higher marginal return to a tariff change for the pro-tariff group compared to the relatively K-rich, anti-tariff group. Following Propositions 1 and 3 above, this will mean that the relatively labour abundant, pro-tariff group will spend relatively more money influencing the high income tax party, and will see a better proposed policy as a result. The party proposing a higher income tax, will also propose a higher tariff, not because of any ideological leanings, but because they are induced to by the influence exerted on them by the pro-tariff group. The poorer, labour-abundant, group will spend more money influencing the high income tax party, not because of any direct benefit of a higher income tax, but because of the positive interaction this creates in terms of the return to the tariff, in comparison to that generated by the low tax
party. This highlights the role of policy interactions that I have envisaged, differences in political parties other policies, create demand-side effects that alter the equilibrium outcomes of political markets.

4 Conclusion

I have developed a simple model of political economy based on the model of Becker (1983) focussing on the role of special interests and their demand for policy from politicians who can be influenced by SIG pressure. The main result of this analysis is that when the fixed policies adopted by a political party affect the demand for "pliable" policies from the special interests there can be substantive consequences for the outcomes of the political process. In particular a positive impact on the marginal return to a policy improvement will lead to an increase in political activity by SIGs on both sides of the issue, whilst a negative effect will reduce the level of political activity. Recognising this fact we should expect that special interests will not treat different political parties in the same way, as has been assumed in so many other papers of political economy. For example it is not rational to give large sums of money to a party for them to change their policy in your favour when the benefits of that policy will be severely curtailed by the implementation of the other policies the party plans to introduce if they win the election. Therefore even if a generally pro-

\[15\text{This pattern would of course be different in a relatively labour abundant country. If were to maintain that the now anti-tariff, relatively labour rich individuals were poorer than their capital-rich fellow citizens then the it would be the high income tax party who would create higher returns for the anti-tariff group, and would therefore be induced to propose a lower tariff than the low tax party.} \]
business party is willing to offer labour unions a good policy in one area, the benefit of that policy is unlikely to be as great as that obtained from the same policy, by a pro-union party who will also be introducing various other beneficial policies. The acknowledgement of the role of interactions can therefore help us understand the pattern of contributions from interests, and to a degree the relative success of different political parties.

I have also applied these ideas concerning the political market to a model of trade to show how differences in a fixed policy (an income tax) can affect the returns that SIGs see to trade trade policy (a tariff). We see that differences in political parties fixed income tax platform do affect the marginal returns to trade policy, and that this effect is different for pro and anti-tariff groups. In particular I show that the high tax party will generate larger returns for the pro-tariff SIG than for the anti-tariff SIG, and will therefore propose a higher level of trade protection than the low tax party.

For future research the ideas in this paper could be tested empirically by analysing the pattern of campaign contributions in relation to the other policies adopted by political parties. I would also like to expand the model to consider a full "general equilibrium" in the political market where there are interactions not only from the fixed policies to the individual pliable policies, but between the set of pliable policies also. Finally the application of the political model to other trade policy models, and generally to other models of economic policy could provide a better understanding of the political equilibrium in such markets.
5 Appendix

1. The second-order condition for equation 6 to give utility maximising conditions for $c^1$ is as follows:

$$\frac{d^2W^1}{(dc^1)^2} = (n^1)^2 w_p^1 \left(I_{qq}^1(q_m^1)^2 + I_{qm}^1 q_m^1 \right) + \left[I_{q_m}^1 q_m^1 n^1\right]^2 w_{pp}^1 < 0 \quad (18)$$

Sufficient conditions for this to be satisfied for group 1 (for whom $w_p$ is positive) are if $I_{qq}^1, q_{mm}^1$ and $w_{pp}^1$ are all negative. That is to say equation 6 will certainly give a utility maximising value for $c^1$ if the utility function, influence function, and political pressure production functions are all strictly concave.

For group 2 we have:

$$\frac{d^2W^2}{(dc^2)^2} = -(n^2)^2 w_p^2 \left[I_{qq}^2(q_m^2)^2 + I_{qm}^2 q_m^2 \right] - \left[I_{q_m}^2 q_m^2 n^2\right]^2 w_{pp}^2 < 0 \quad (19)$$

For group 2 (for whom $w_p$ is negative) this condition will be fulfilled if $w_{pp}^2$ is positive and $q_{mm}^2$ and $I_{qm}^2$ are negative i.e. all the relevant functions are strictly concave.

2. To analyse the slope of the reaction function consider the impact on the optimality condition shown in equation 6 ($\frac{dw^1}{dc^1} = \frac{\partial w^1}{\partial p} \frac{\partial q_m^1}{\partial q} \frac{\partial q_m^1}{\partial m} = 1$), of an increase in spending, and hence pressure, by the other SIG. Of the three terms in this condition, the marginal productivity of political spending in producing pressure ($\frac{\partial q_m^1}{\partial m}$) is unaffected, as is the marginal impact of pressure on influence, thanks to our assumption that $I_{q^1,q^2}^1 = I_{q^2-q^1}^2 = 0$. The only effect therefore is on...
marginal utility of a policy change; $\frac{\partial w^i}{\partial p}$, which due to the concavity of the utility function will increase in size as the rival SIG exerts more influence, and receives an improved policy, which is a worse policy from our SIGs perspective. If SIG 1 were to do nothing in response to the increase in pressure by SIG 2 it would therefore be the case that $\frac{\partial w^1}{\partial p} \cdot \frac{\partial I^1}{\partial q^1} \cdot \frac{\partial q^1}{\partial m^1} > 1$. To maintain equilibrium it must therefore be the case that the SIG spends more money, produces more pressure, increases its influence, and moves policy in their favoured direction once again. All these things reduce the size of the components of $\frac{\partial w^i}{\partial p} \cdot \frac{\partial I^i}{\partial q^i} \cdot \frac{\partial q^i}{\partial m^i}$ due to the assumed concavity of all these functions. The same logic applies for SIG 2 in response to an increase in pressure by SIG 1. Therefore reaction functions are upward sloping, an increase in pressure by one group will cause the other group to increase their pressure also, due to the concavity of the utility, influence and pressure functions.

3. Proof of Proposition 1: Optimal spending per member of a SIG is chosen in order to satisfy the condition from equation 9 that $\frac{\partial w^i}{\partial p} \cdot \frac{\partial I^i}{\partial q^i} \cdot \frac{\partial q^i}{\partial m^i} = 1$, a larger $\frac{\partial w^i}{\partial p}$ for a given policy must mean that something else in this condition becomes smaller, in order to balance the optimality condition. The $w(\cdot)$, $I(\cdot)$ and $q(\cdot)$ functions are all assumed to be concave in policy, pressure and spending respectively therefore one of these things must increase in order to reduce the size of the marginal condition. As policy can only be improved due to the SIG having more influence, and influence is only increased by more pressure, and more pressure is down to greater spending by the SIG, it follows that the larger is $\frac{\partial w^i}{\partial p}$ the more money the SIG must spend in equilibrium.
4. Proof of Proposition 3: Proposition 1 shows that a SIG seeing a higher marginal utility of a policy change will put more resources into influencing the party, but with upward sloping reaction functions, so will the other SIG. If it is SIG 2 who is seeing a higher marginal utility due to a positive interaction, then the optimality condition for SIG 1: \( \frac{\partial w_1}{\partial p} \frac{\partial t^1}{\partial q} \frac{\partial q^1}{\partial m} = 1 \) sees the \( \frac{\partial t^1}{\partial q} \frac{\partial q^1}{\partial m} \) term become smaller as the SIG spends more money to produce more pressure (due to the concavity of the \( I(\cdot) \) and \( q(\cdot) \) functions). Therefore to satisfy the optimality condition it must be the case that the \( \frac{\partial w_1}{\partial p} \) term becomes larger, which due to the concavity of the \( w(\cdot) \) function and noting that we have assumed \( I_{q_1,q_2}^1 = I_{q_2,q_1}^2 = 0 \), must mean a less favourable policy for this SIG. This in turn must mean that SIG 2 is getting a better policy proposal. The same logic applies when it is SIG 1 who is seeing the benefit of the interaction with the fixed policy.

5. We consider here the concavity of SIG welfare with respect to the tariff. Prices are linear in the tariff, income share \( \phi^i(\cdot) \) is strictly concave in prices. Differentiation of equation 16 gives:

\[
\frac{\partial^2 W^i}{\partial \tau^2} = w_{Y,Y^i}(\cdot) \left[ -\phi^i(\cdot) M(\cdot) - \phi^i(\cdot) X_2(\cdot) t + Y \frac{\partial \phi^i(\cdot)}{\partial p_2} \right]^2 + w_{Y^i}(\cdot) \left[ \frac{\partial \phi^i(\cdot)}{\partial p_2} \left[ (1 - t) X_2(\cdot) - M(\cdot) \right] - \phi^i(\cdot) M(\cdot) + Y \frac{\partial^2 \phi^i(\cdot)}{\partial p_2^2} \right] (20)
\]

To analyse the sign of this expression first we note that \( w_{Y,Y^i}(\cdot) \) is negative due to the concavity of the \( w(\cdot) \) function and the first square bracket is squared,
so the first term is certainly negative; the increase in income for the relatively labour rich due to a tariff rise, drives down the marginal utility of income. The second term represents the change in the extra income from a tariff. Marginal utility of income \( w_Y(\cdot) \) is positive therefore the second term is negative if imports \( M(\cdot) \) are sufficiently large relative to home production and the income share function \( \phi_i(\cdot) \) is sufficiently concave. For the relatively capital rich the second square-bracketed term is certainly positive if again imports are sufficiently large and the income share function is concave. It must therefore be the case that the second term is larger than the first term in order to show concavity of utility in the tariff for the relatively capital rich group.

References


