

How to extort free trade:

CGE models as powerful artifacts of the liberal creed?

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1. Introduction

Free trade is one of the three historical tenets of economic liberalism mentioned by Polanyi (1944: 141). Free Trade Agreements (FTA) such as the north American NAFTA, the southeast Asian AFTA, the transpacific TPP, the transatlantic TTIP or the unfinished Doha Round for developing countries and the enormous political effort flowing into the respective negotiations serve as witnesses for Polanyi's central argument, that a "free market" is the product of forceful political interventions and not at all the result of natural forces shaking off state influence.

This paper will not focus on the well-studied content and consequences of these and other FTA. Rather I will concentrate on the intellectual conditions professional economists establish in order to foster the acceptance of FTA.

When economists argue in favor of a contested FTA, especially if they do so in public realm, they regularly cite Ricardo's theory of comparative advantage and its popularized textbook-example of Portugal and UK trading clothes and wine. This deliberate oversimplification is complemented with references to growth projection numbers, often precise at the level of tenths of a percentage point and broken down to different branches of the economy. In the case of the TTIP the relevant study on behalf of the European Commission (CEPR 2013) predicts a 0.5% increase in EU's GDP, 12.0% increase in output of metal products but only 0.06% increase in agriculture, forestry and fishery together. Actors and commentators in favor and against FTA frequently pick up such figures in debate, but hardly ever shed light on their sources or reflect on their limitations. The aim is to close this gap by first taking a closer look at the Computable General Equilibrium models (CGE) as applied in the TTIP-study. CGE models are complex, tailor-made pro-free-trade-crafts that are full of unrealistic neoclassical assumptions and accompany almost every FTA negotiation.

In section 2 I will give an overview over the CGE methodology, questioning the central indicator "welfare", explicating crucial assumptions behind the conception that can rightfully be named "utopian capitalism" (Mark Sagoff quoted in Taylor and von Arnim, 2006:5) and showing how modelers exert influence on results. Section 3 will briefly investigate the importance of CGE models in media coverage and policy making. Finally section 4 suggests a theoretical combination of the institutionalist perspective (especially Campbell, 1998) with the performativity of economics approach (MacKenzie et al, 2007).

This paper presents some preliminary results of the ongoing research project "performativity of economic models" conducted at the Institute and funded by the Institute for New Economic Thinking (INET).

2. CGE-models as portrays of “utopian capitalism”

The term Computable General Equilibrium (CGE) models refers to a class of economic models that aim at analyzing the effect of external changes stemming from policies or technologies on the entire economy. Therefore they are macroeconomic models in terms of their explanatory claim. Yet in terms of methodology they are they are rather microeconomic models, supposedly based on individuals' utility maximizing decisions. Or in economists' language, CGE models are an outstanding example of micro-based macro.

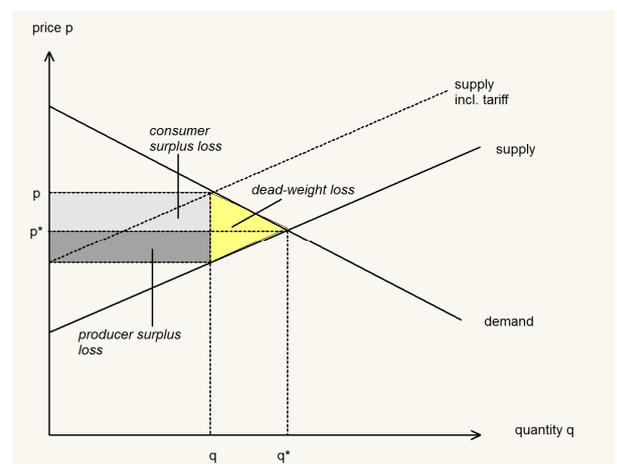
As many other economic models, CGE models consist of a) abstract mathematical equations describing the assumed relationship between the variables on macro (“functional forms”) and on micro (“behavioral equations”) level and b) a database covering the empirical transaction values of an economy in form of an Input-Output-Table based on national accounts (called “Social Accounting Matrix” or SAM) as well as c) estimated parameters to capture behavioral responses (“elasticities”). Since CGE models apply more variables than equations, not all variables can be defined in respectively by the model (“endogenous”) but are fixed by the modeler respectively outside the model (“exogenous”). The decision, which variables are assumed constant (“closure”) introduces causality to the model gives rise to constant debate.

The rest of section one will question and discuss five central elements of CGE models: a) the meaning of welfare, b) some crucial assumptions, c) the applied elasticities, d) the closure rules and e) the SAM.

2.1. “Welfare”: Measuring off little triangles

When CGE-modelers estimate the gains of trade, they are usually measured as “welfare gains” (sometimes denoted as “economic gains”) for an economy. A term easily (made to be) misunderstood. Outside the economists' realm, “welfare” is commonly understood as some minimal level of wellbeing and social support. In economics the term is used quite differently as “surplus”.

The conceptional core of CGE models works like a standard microeconomic textbook model with a downward sloped demand curve (the lower the price, the higher the quantity demanded by consumers) and an upward sloped supply curve (the higher the price, the higher the quantity supplied by producers). The intersection of the two curves gives the equilibrium price p^* and quantity q^* . The triangle between the two curves shows the overall surplus (or welfare), which is divided up between consumers and producers. Consumer surplus thus measures the excess willingness to pay over the market price and vice versa for the producers. This optimum equilibrium is distorted by the introduction of tariffs, raising the price ($p > p^*$) and thus reducing the demanded quantity ($q^* > q$). The surplus is not only reduced by the tariff revenues (grey rectangles), but also by a dead-weight loss (yellow triangle). In economic theory, the dead-weight loss is attributed to allocative inefficiency, implying that it occurs at nobody's gain. In the case of free-trade negotiations, the removal of tariffs creates welfare gains at nobody's costs, only by achieving more efficient allocations.



There will be more to say on critical assumptions of this reasoning in the following sections. The important argument here is: When CGE-models estimate welfare gains they conceptually measure-off triangles. Whilst “the usage of the term ‘welfare gains’ in the public debate implies (...) a certain universality, as if a higher number for welfare would imply an improvement in the general well-being of individuals” (Taylor, von Arnim 2006:11), in fact this “welfare” captures the fictional utility benefit occurring in an Utopian market at no one’s cost. In this theoretical framework each and every tax or tariff reduces “welfare”, its removal necessarily implies economic gains. “Liberalizing trade automatically improves the micro world.” (Mitra-Kahn 2008:62)

2.2. “As if” (1): Assumptions of “utopian capitalism”

The microeconomic core of CGE comes with the usual unrealistic neoclassical assumptions about individuals and their behavior. One of the most puzzling examples is how theory deals with the necessary aggregation of different individual agents. A requisite of microeconomic demand curve is that all consumers are extremely similar, and the same must hold true for producers. Obviously this assumption does not reflect reality. There are three possible routes to justify this (Taylor, von Arnim 2006: 11): The most common is to assume a ‘representative agent’, that is an economy with exactly one person (Robinson Crusoe?) - a striking example of the fallacy of composition (see Kirman, 1992). Next to this, the representative agent demands fixed income distribution and an income elasticity of demand equal to one (double income leads to exactly double demand for every product). A second way out would be the assumption of a social welfare function, defining how to aggregate individual utilities into an indicator of general well-being. Practically it is unclear, who would direct this social welfare, and theoretically it has been proven impossible to construct such welfare functions (see Arrow, 1950). Finally, and perhaps most absurdly, winners could pay a compensation to losers in order to exactly reach the desired Pareto optimum – there are no signs, that this would be the case in reality, nor is there a convincing way to calculate the compensation. The problem of utility aggregation is by far not exclusively faced by CGE models, but by all neoclassical equilibrium models. In “utopian capitalism” agents are thus not only strictly utility maximizing, they are also completely identical to each other. Ironically, it is perhaps the dissemination of the problem that renders it negligible to most mainstream economists, perhaps the opportunity costs of addressing it are to just too high.

Another feature of many CGE models is how to reconcile utopian capitalism with perfect markets with observed reality. In theory, when imported products are cheaper than identical domestic products, one should assume that only imported products are bought. To rule out a counter-factual complete crowding out by imports most CGE models introduce the so called Armington assumptions, implying a) that imported intermediate goods are non-competitive and thus cannot substitute domestic intermediate goods and b) that final goods are imperfectly competitive due to an assumed preference of consumers for domestic products. The first assumption renders intra-company trade irrelevant and thus ignoring precisely what constitutes multinational companies. The second assumption, although reasonable at the first sight, makes that share of imported goods depend on the modeler’s decision on elasticities.

One constituting feature of capitalism is its inherent dynamic, the change in technologies and production structures. To be fair all economic models face severe difficulties capturing this change, in part because future developments are unforeseeable. What is interesting is the way CGE models bypass the challenge. In their simplest form CGE models are comparative-static: The economy is in

equilibrium in period $t=1$. Then the modeler triggers an external shock (e.g. reduction of tariffs) leading to a new equilibrium in $t=2$, the difference between the two equilibria is interpreted as the outcome of the policy change. In more sophisticated models, there are in fact several additional models applied before and after the CGE is run, such that variables exogenous to the CGE model are endogenized in other models and the results are fed back to the CGE. These “lurching equilibrium models” conduct iterations until a new equilibrium is reached, thus the long-term equilibrium is the end-product of many consecutive static short-term equilibria. Certainly “lurching equilibria” are a step towards reality, yet in its core it is still static. The structural change of economies, such as the rise of certain industrial sectors, can only be accounted for, if the modeler introduces the change himself. Thus, if economies would resemble the model, if it were not for policy shocks, capitalism would have reached its endpoint, in which internal pressures for change have run out and succumbed to the almighty equilibrium. Just like in Utopia.

The neoclassical edifice is full of such baroque details that obviously do not occur in the real economy. The underlying assumptions are more than negligible mathematical details of an otherwise realistic depiction – rather they should be seen as explication what the world would need to look and behave like for the welfare and equilibrium theorems to matter (cf. Raza et al 2014:30).

2.3. “Elasticities”: The power of the unobservable

Gains of trade crucially depend on the dead-weight loss accompanying taxes and tariffs. In the graphic representation the size of the triangle can easily be modified by changing the slope of the curves – the flatter the slope, the bigger the triangle. In economic theory the slope corresponds to the price elasticities of demand and supply. If the representative consumer exhibits a high price elasticity, she will only reduce the quantity demanded by a small portion if prices increase by 1 unit. If on the other hand the reduction in demanded quantity is high, economists speak of lower elasticity.

Theoretically the concept of elasticity is straight-forward. In reality the parameter values for elasticities are not directly observable and in most CGE models (depending on the choice behavioral equations) have to be set exogenously, that is by the modeler. There is a constant debate on econometric and statistic procedures applied to estimate elasticities, yet there is not even a broadly accepted range of values regarded suitable. Bouet (2006:84) compares different CGE studies based on the two most important databases and finds that LINKAGE values for elasticities are on average 35% higher than GTAP values and 75% higher in agriculture. The effect on the trade benefits is huge: While the GTAP model predicts ‘only’ 84 billion worldwide trade benefit in a “realistic” Doha scenario, the LINKAGE based model predicts 287 billion. The differences in elasticities are not the only, but a very important source of this divergence. Mitra-Kahn concludes that thus “model builders choose the magnitude of the changes the model will predict” (2008:67). The choice of elasticities limits the range of possible outcomes: “One can safely assert a priori that the estimates of welfare gains from full trade liberalization will be somewhere in the vicinity of -0,5 per cent to +2-3 per cent, depending on the choice of elasticities” (Taylor, von Arnim 2006:12).

2.4. “Closure”: The invention of causality

The perhaps biggest theoretical decision CGE-modelers face is to define the so called closure rules. The necessity to do so stems from the fact, that the number of endogenous variables must not supersede the number of equations. Thus it's up to the modeler to decide upon which variables are treated as exogenous, that means their value is chosen a priori and not a result of the model itself. Theoretically the choice is between as many possible closures as there are variables to the power of two. More practically: The CGE model can either compute the wage level or the employment, either current account or exchange rate, either the level of taxes or the government deficit. In any case, one is assumed constant or the rate of change is prompted by the modeler.

This is anything but a minor technical decision, since the closure sets the direction of causality. Does the level of investments automatically (endogenously) adjust to the given (exogenous) level of savings, thus do cause savings investments as neoclassical economists would assume? Or is it rather the other way around, that the level of investment is decided by entrepreneurs and the savings follow through additional income, a rather Keynesian interpretation of investments causing savings? Are tax rates automatically (endogenously) adjusted to hold budget deficit constant or are tax rates constant and the deficit is allowed to rise and fall? In terms of trade most important: Is the exchange rate volatile in order to fix the trade balance – or is the current account allowed to deteriorate?

Of course, living in a complex world, there are no unidirectional truths. Rather, the choice of specific closure rules seems more realistic (or at least less unworldly) in the one case but completely wrong in the other. Given that this problem is inherent to many economic models, it is disturbing that closure rules tend to be downplayed and only rarely justified.

The quantitative importance of closure rules is demonstrated by Taylor and von Arnim. They use the same data as the World Bank simulating a the “likely Doha” scenario between Sub-Sahara Africa (SSA) and the Rest of the world (ROW), but opposite closing rules as in the World Bank's model: Savings follow exogenous investment (not vice versa), deficit follows exogenous tax rates, current account follows given exchange rate and employment is not fixed but wages are rigid. Since the World Banks closing holds major policy variables constant (employment, government deficit), unsurprisingly the Banks model exhibits greater stability. Depending on the closure rules the welfare effects for ROW oscillates between -0,6% and +0,7%, for SSA between -0,2% and + 2,2%. What is more important, taking the Banks closure rules, effects of liberalizing trade on employment, government deficit and current account are assumed zero a priori. Switching the closure rules reveals small effects on employment (positive für SSA, negative for ROW) and significant effects on government debt (negative for SSA, positive for ROW) and current account (negative for SSA, positive for ROW). Thus results heavily depend on closure rules.

The reasonable way to proceed would be to include different top-level closure rules in studies, make transparent the differences and argue what makes one set of rules better suited to answer the question at hand. Needless to say, this would not increase the credibility (and impact) of such studies.

Instead the CGE-community introduced or rather invented so called “neutral closures”, which in fact are three extra equations created after closing the model for GDP and one each for the share of government expenditures and investments respectively (the share of households demand follows from the latter two). This “trick” guarantees that consequences of policy changes (trade liberalization or “shocks” in model terms) are shared equally among demand aggregates (households,

government, investments). There is no theoretical rationale behind the “neutral closure”, instrumentally it prohibits disproportional effects on one demand aggregate (Mitra-Kahn 2008:65). On the surface the jargon insinuates a solution to the problem of closure dependency of CGE results. In substance this solution does not reduce the model dependency itself but only its latitude.

2.5. “SAM”: Benchmarking reality

Next to the before mentioned issues of the theoretical CGE components, modelers also face severe empirical challenges. The empirical base is a Social Accounting Matrix (SAM), which is a modified, disaggregated representation of the national accounting framework in matrix form. It includes all monetary flows of an economy by sources and recipients occurring in a reference year. The matrix has two theoretical advantages: It can easily be expanded by adding rows and columns for sectors of the economy as long as each source of fund has an recipient. Secondly, following the accounting principles the SAM always fulfills the macro balancing equations.

Empirically the SAM first has to be adjusted in order to fulfill the balancing condition: Blanks are filled and data items are changed to get columns and rows to equal (“balanced SAM”). This process is euphemistically called “benchmarking”, another case of rhetoric downplaying the influence of modelers. These changes are hardly ever made transparent to the reader, although they might in extreme cases account for up to 11% of GDP and quadrupling incomes in agricultural sector as in the case of Mozambique 1995 (Mitra-Kahn 2007:58).

The importance of balancing or benchmarking the SAM is deeply rooted in the methodology: If the SAM is in balance, the economy is in equilibrium. Needless to say, this equilibrium is constructed, not real. Equilibria are assumed to be self-correcting and stable. This allows the modeler to “shock” the equilibrium by assuming a policy change, e.g. trade liberalization, and observe how endogenous variables react to the shock, that is move to a new equilibrium.

2.6. Summary

To summarize the first section: CGE models are representations of “utopian capitalism” based on dubious assumptions on the individual and the economy. It seems fair to say that they can be (and in practice are) used as tools or artefacts of liberal creed. Yet this finding heavily depends on decisions met by the modeler, which are regularly rendered purely technical or concealed, while they exert enormous influence on the model results. Specifically a mindful “consumer” of CGE projections should thus ask:

- Are projected gains from trade liberalization measured in terms of GDP, imports / exports or welfare?
- Are the applied parameter values for elasticity plausible or tested empirically, have alternative values been inserted and how does it affect projections?
- Which factors have been assumed constant (employment, deficit, trade balance, ...) by the closing rules? Is there a rationale for the chosen closing rules against alternative rules? In case of a “neutral closure”, how would results change without?

- Which changes were necessary to balance the SAM? How are GDP and sectoral incomes affected by the benchmarking process?
- Given the answers to the last three questions, is the level of precision justifiable or spurious?

3. CGE-models as “powerful artifacts”?

While the first section focused on the building principles of CGE model, the second section asks for their importance in trade policy. To this end a media analysis was conducted, reflecting the importance of public discourse. Secondly the question of importance for negotiators is raised and partially answered.

3.1. “As if” (2): Importance in media

In order to quantify the effect of CGE-models on public discourse we analyzed media reports on TTIP. Specifically we analyzed four European quality papers from four different countries: Financial Times (UK), Die Zeit (Germany), Le Monde Diplomatique (France, but edition in German language), El País (Spain). All articles between 2013 and 2015 that mentioned TTIP (or Transatlantic Trade and Investment Partnership or respective translations) were analyzed and categorized. Category 1 includes all articles that neither mention growth projections or one of the studies. Category 2 articles only mention the isolated headline projection numbers (GDP) but do not reveal more detailed numbers, or who made the projection on who’s commission and with which methodology. Category 3 finally includes all articles that at least tackle one of these issues. The results are given in the table respectively diagram below.

	Articles mentioning TTIP	Category 1 (no reference to projections / study)	Category 2 (only projection numbers mentioned)	Category 3 (details/ authors/methods mentioned)
Financial Times (UK)	143	90%	7%	3%
Die Zeit (GER)	100	89%	9%	2%
Le Monde Diplomatique (FR)	11	64%	18%	18%
El Pais (ES)	122	76%	20%	3%

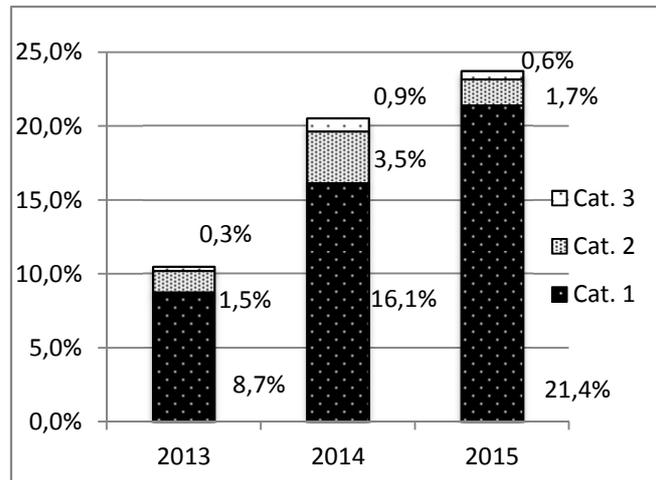
The analysis reveals that the vast majority of articles containing TTIP do not even mention the studies or one of their projections results. This is somehow surprising since the supporters and promoters of posit economic growth as the central argument in favor of the FTA. One untested hypothesis would be that there is a certain distrust with economists projections in general public and among journalists, so journalists decide not to print the numbers. Another opposite hypothesis would be that the growth projection numbers in fact seem very low, given the magnitude of the endeavor, so that their presentation in media would in fact harm the argument.

Another interesting insight is that the ratio between “just headline number dropping” and giving a minimum of background information or further details is between 1:2,5 (FT) and 1:6 (El País), the great exception being the monthly published Le Monde Diplomatique, taking a critical stance towards liberalism.

Finally it is noteworthy that among the 12 articles in category 3, there is exactly one article that critically scrutinizes the methodology (Die Zeit, 29.1.2015, p. 23: “Nützliche Ideologen”, addressing critically the role of economists for politicians and ideologies in general, TTIP is one example). The remaining category 3 articles either uncritically mention projection numbers for sectors, compare figures for different studies or mention critics of the studies without entering the field of methodology.

Another evaluation of the data tries to capture the magnitude of coverage. To this end the number of articles were normalized with respect to the number of issues published per year (688). A fictional subscriber (and reader) of all four papers would find a category 1 article in 8,7% of the all 2013 issues but only 0,3% (or 2 articles) of category 3.

This perspective reveals that the coverage over all categories doubled from 10,5% in 2013 to 23,7% in 2015. Yet this remarkable increase comes only from category 1 articles. In absolute numbers there were 12 articles mentioning projection numbers or more (category 2 and 3 together) in 2013, 30 in 2014 and only 16 in 2015.



3.2. “As if” (3): Importance in negotiations

Scott and Wilkinson analyzed the role of expert knowledge in trade policy, finding that the number of published CGE-studies peaked in years when ministerial meetings to advance the Doha Development Agenda took place (2012:4).

Second, the most cited of these studies were conducted by economists who are or were related to the World Bank (Scott and Wilkinson 2012:4). They also found that studies applying assumptions that comparatively increased trade benefits were cited oftener than others (2012:6). Which is not surprising if one looks at the genesis of CGE-modeling. Most CGE-modelers would trace their origin to the early 1970s with the work of Adelman and Robinson on the South Korean economy. In a more critical account Mitra-Kahn elaborates the path from Leontief in the 1950s up to the present, also highlighting some inconsistencies. Initially CGE-ancestors were of interest to a small portion of academia only, but starting with the 1970s the World Bank invested more and more energy into the development of economy-wide modeling, soon followed by the International Monetary Fund (IMF).

Today the market for CGE-models (databases, software, updates) and modelers (training and hiring) is heavily dominated by three institutions: The World Bank (GTAP project, LINKAGE), the Center of Policy Studies (CoPS, IMPACT project) at the Australian Monash University and the International Food Policy Research Institute (IFPRI), funded by Governments and the World Bank. Earlier on databases and software were open-source and free, by now a one-week seminar and consequent access to databases are charged with around 5.000 dollars for a single academic.

While there is no doubt that a group of “trade intellectuals” heavily influenced the production of CGE-studies and thereby promoted the World Bank’s agenda, Wilkison and Scott find an important shift among intellectuals accompanying the power shift among trade policies (rise of BRICS states, idea of the developmental state vs. neoliberal orthodoxy). The “old guard” of Worldbank’s economists is increasingly under pressure from “new ambassador intellectuals” from countries such as South Africa, India, China, Bangladesh, Brasil and Zambia. So called developing countries built up competence to conduct their own research and thereby reduced dependence from the Worldbank’s orthodox studies.

As part of the ongoing research project further interviews with EU policy makers will be conducted to analyze the importance of CGE models to them. One of the first interviews was conducted with a spokesperson of two members of European Parliament, both dedicated to free trade and equipped with high level economics training. He told us that the study presented by the European Commission is of little importance to them for different reasons. For the older one due to a general skepticism towards econometric exercises – to him free trade, that is the abolishing of tariffs and other barriers, is always beneficial. For the younger one it is too early, since modelers have to make too many assumptions not knowing what will eventually be agreed on, so that results necessarily are unreliable. Another spokesperson from a left-wing Member of Parliament, himself a trained econometrician, told us, that such studies could reveal almost any result the modeler (respectively principal) wishes to obtain. All three agree that the principal endeavor of such studies is to influence the public.

3.3. Summary of section 2

It seems that CGE-models respectively their producers have already seen better days. On the one hand there is increasing competition from critical economists and the so-called developing countries are no longer dependent on their calculations. On the other hand even promoters and supporters of “free trade” in the policy arena show reluctance in embracing their work.

The picture is not much different regarding media coverage. Our analysis shows that the vast majority of newspaper articles in quality papers do not even pick up headline results. Secondly, and perhaps consequently, even if one closely follows the coverage, there is no chance of being informed about the troublesome issues mentioned in section 1 of this article. Finally, although overall coverage doubled within in the analyzed period, there is no likewise increase in referencing projection numbers.

4. The power of ideas: “Econophobia” and “Naked Emperor”

Even though the findings of the preceding section indicate a decline of power of CGE-models in trade policy, the role of economists in policymaking remains an interesting and important field of study. Especially so in trade policy, as “few propositions command as much consensus among professional economists as that open world trade increases economic growth and raises living standards” (Mankiw, 2006).

On one hand, the relationships between economic ideas, policies and society have been widely studied by institutionalist scholars. Hall (1989, 1993) contributed to the debate about whether interests or ideas shape policies by arguing that shifts in economic policy paradigms cannot be understood properly without accounting for the importance of ideas. Yet, institutionalist scholars and political scientists tend to treat economic models as a black-box, an approach Watson (2014) sharply termed “econophobia”.

In this line of reasoning science studies have raised the issue of performative economic science, claiming that economic models “do not merely record a reality [...] but contribute powerfully to shaping, simply by measuring, the reality.” (Callon 1998, p. 23). The performativity literature also claims that “[e]conomics swings between representation and action, between science and policy, between academic inquiry and political intervention, both as a discipline and in the careers of many individual economists.” (MacKenzie et al 2007, p. 2)

Against this background it seems productive to combine the two approaches. We propose a simple extension to a framework presented by Campbell (1998) which blends historical with organizational institutionalism in order to reach a better understanding of ideas in political economy. Campbell distinguished ideas along two dimensions: their location within the debate (foreground or background) and their character (cognitive or normative). More specifically, Campbell defines paradigms as cognitive background assumptions and public sentiments as normative background assumptions, both of which limit the range of policy alternatives being considered as useful and legitimate. Ideas in the background are not necessarily invisible to the actors, yet they commonly remain unmentioned and unquestioned. In the foreground of the debate, programs are cognitive concepts that specify policy solutions, while frames are normative concepts and symbols that legitimize policy proposals. Campbell merely hypothesizes about a hierarchy or sequence of different types of ideas (1998: p. 399f): Given the perception of a policy problem, a program proposal must, first of all, fit the dominant paradigm. Secondly, the program has to be perceived as an effective solution, which in turn is enhanced by packaging it in simple enough terms, so that it can be understood by policy makers, providing clear policy guidelines. Thirdly, the program has to fit prevailing public sentiments, which are, fourthly, fostered by the respective framing.

We propose to introduce economic models as devices of transmission between background assumptions and concepts in the foreground (see table below). At the cognitive level, economic models transmit between paradigms and programs, thus bringing in the performativity of economics approach. At the normative level, we propose problem narratives as a counterpart to models, whose function it is to deliver a deliberate reduction of complexity through highlighting certain aspects of a problem as well as its causes and effects and by masking other aspects.

The extensions – ideas as models and ideas as problem narratives – facilitate the analysis of formal models as transmission devices between paradigmatic assumptions and specific policy prescriptions. In the case of FTA, CGE-models obviously were developed and employed to transmit the general free trade paradigm into proposals to cut specific tariffs and other barriers. The role of the model is not only to quantify the effect, be it of spurious precision as it may, but also to provide a rationale of

problem and solution embedded into an overarching and systematic account of the economy.

	Concepts in the foreground	Devices of transmission	Background assumptions
Cognitive level	<i>Program</i> Ideas as elite policy prescriptions that help policy-makers to chart a clear and specific course of policy action	<i>Model</i> Ideas as tailor-made models that build upon formalized assumptions to define problems, to specify causes and to quantify effects.	<i>Paradigm</i> Ideas as elite assumptions that constrain the cognitive range of useful solutions available to policy makers
Normative level	<i>Frames</i> Ideas as symbols and concepts that help policy makers to legitimize policy solutions to the public	<i>Problem narrative</i> Ideas as narratives that build upon public sentiments to highlight certain aspects of a problem as well as its causes and effects.	<i>Public sentiments</i> Ideas as public assumptions that constrain the normative range of legitimate solutions available to policy makers.
	overt		hidden

The extension secondly allows to investigate the tension between positive and normative aspects of the model and thereby to capture the interaction with narratives and frames helping policy makers justifying programs to the wider public. The positive component of CGE models rests in the SAM and the computed reaction of the economy when moving towards a new equilibrium as a result of policy shifts. Underneath CGE models are full of normative implications such as the constructed win-win-situation (welfare gains at nobody's loss through better allocation) or the deliberate absence of industrial policies (not necessary, trust the force of competition and profit-maximizing entrepreneurs), of adjustment processes (not relevant, whatever happens, there will be a new equilibrium) or of employment issues (full employment as long as wages adjust freely).

Furthermore the extension is suitable to better relationship the interaction between shifts in the political and the academic arena. Braun (2014) convincingly argues, why models matter in terms of macroeconomic governability: Next to the perceived functioning of new policies, it needs an integrated vision of the economy, its formalization and operationalization and finally its measurement and quantification. A potential fourth step is overconfidence in methods and theories opening room for successors. Following Hall (1989) shifts in policies are accompanied by shifts in paradigm, Braun thus adds necessary shifts in methodology and modelling strategy. In the case of trade negotiations the increased political influence of the BRICS and other so-called developing countries was accompanied not only by their economic catching up, but also by their building up of modelling competence.

To conclude, this paper has shown that CGE-models are at best beautiful representations of utopian capitalism, once powerful artefacts crafted by intelligent men and women. They hardly offer reliable guidance for managing the real economy. The nakedness of the emperor has been discovered by so-called developing countries (who increasingly rely on own calculations) and seemingly also by the media (who tend to ignore CGE-based growth projections). Yet it would be completely wrong to conclude that models are irrelevant outside professional economics. Rather I would argue that it needs social scientists from outside economics to reduce the reliance on naïve vision of utopian capitalism. To this end possible econophobia should be overcome to better understand power plays in economic policy and provide better guidance to policy-makers.

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