PROJECT: CIRCULAR FASHION ECONOMY

TECHNICAL NOTE No 3

THE CGE FASHION MODEL APPLICATIONS

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Economic modelling approach

Economic models are sets of equations representing the major relationships between the various sectors and participants in an economy. These equations together form a coherent, but necessarily simplified, depiction of the workings of an economy. In essence, the modelling process illustrates the outcome of a balancing act (performed by the market) between the demands for goods and services and the resources necessary to produce those goods and services to satisfy such demands.

In Appendix 1, Chart 1, the demands for goods and services are simplified as originating from households, government, and exports. The resources required to produce goods and services comprise labour, capital (machinery, equipment, and buildings), land and other natural resources, and technology. Additionally, some demands are satisfied externally – through imports.

Computable general equilibrium model

A computable general equilibrium (CGE) model is a standard and widely used tool to investigate the impacts of economic shocks or events, or to measure the contribution of sectors or industries to the wider economy. The model captures the inter-relationships between industries and between exports, imports, consumption, as well as their combined resource requirements (see Appendix 1, Chart 1 for further detail on structure).

The model follows standard neoclassical assumptions of market-clearing prices (at which supply equals demand), profit-maximising firms, and utility-maximising consumers. The equilibrium of the economy is determined by market-driven adjustments to the relative prices of production factors (resources) and outputs that ensure supply equals demand in each of these markets. In addition, embedded in the production structure of firms is the standard neoclassical assumption of zero pure (economic) profits, i.e., a firm earning zero economic profit is doing as well by investing its money in capital as it could by investing elsewhere.

The bespoke CGE model developed for BSR needs to analyse the employment effects of the circular fashion development, separately identifies 27 industries, 27 export commodities, 27 household consumption commodities, and 5 occupation categories (see Appendix 2 for further details on the ILO and ISCO08 classification).

Advantage of the modelling approach

An important feature of CGE models is that the equations to estimate demand and supply can be constructed at a detailed industry level. Furthermore, they are based on inter-industry relationships, which show the flows of goods and services between industries. Therefore, the model's estimates of employment and output growth by industry recognise that expansion or

contraction in any one industry leads to a flow-on of demand into many other industries. Thus, we can explore questions such as, 'If the fashion industry production (including recycling and reuse) were to increase 10 percent, how much would that affect the demand for labour by skill, type, and gender?'. In other words, industries use inputs to produce goods and services and some of these inputs are goods and services produced by other industries. The modelling process captures and mimics the relationship between these inputs and outputs.

Furthermore, the ability of certain industries to change the amount (or type) of inputs they use is incorporated in the model. This ability to change (i.e., to react to demand, supply, and price shifts) is limited by technological factors. And the extent to which industries change their inputs is guided by standard economic theory, which assumes producers strive to adopt the lowest-cost method of production.

Data

The limited availability of data as well as practical limitations mean that any model involves a degree of simplification. The model, just like all simplifications of reality, is only as good as the information available. The CGE model in particular utilises information (i.e., data on the aforementioned relationship between inputs and outputs), but such up-to-date and detailed information is always difficult to obtain.

The CGE model is based on inter-industry relationships and the main information comes from input–output tables. The most recent full-scale official input–output tables from GTAP to describe the inter-industry relations in a point in time between 2014 and 2020 were used for various relevant variables. On this basis, a new/updated set of input–output tables were developed for the present study, so that more up-to-date, realistic, and accurate estimates can be made. However, updating input–output tables is a far from trivial exercise. Updated inter-industry transactions tables were generated using the RAS method, which is a method used to update existing input–output tables to relate to a year for which intermediate input (column) sums are known but not the intermediate deliveries themselves (see Technical Note No1 for an overview). Full details on the data and variables sources and updating procedures are available in the two Technical Reports produced for the project.

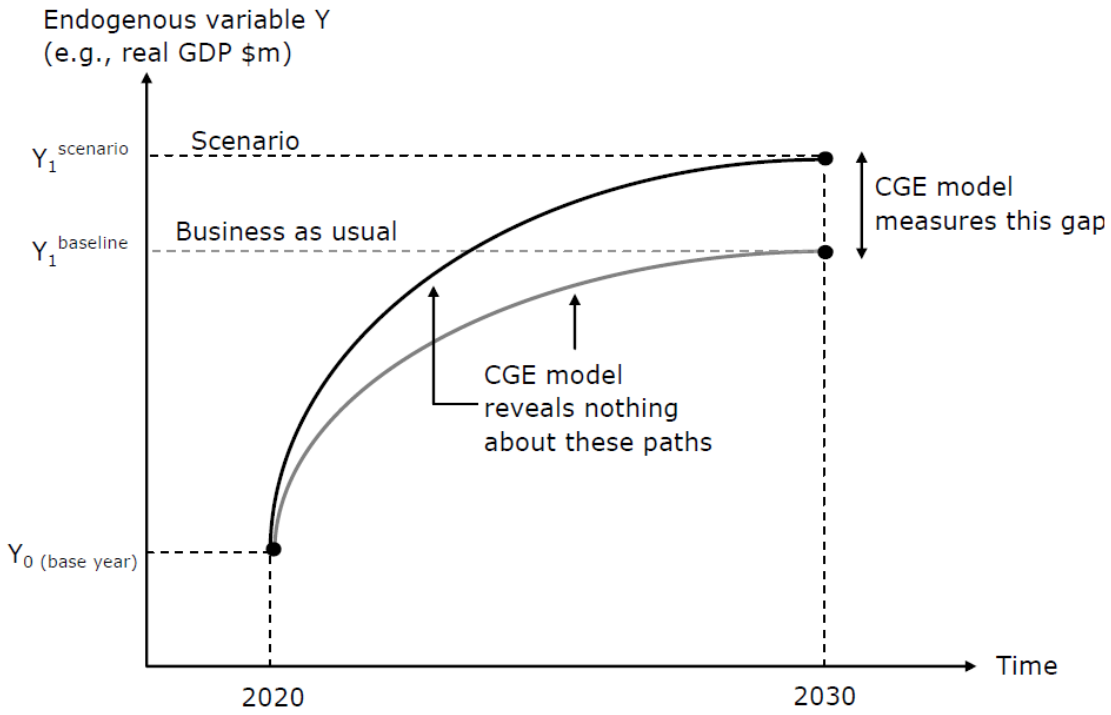
Interpreting model simulations

The CGE model allows us to perform computer simulations to investigate the effect of particular events (shocks) on the economy. For example, we could estimate the changes in major economic variables (e.g., employment or real gross domestic product (GDP)) resulting, for example, from change in population growth (affecting household spending growth), or technological breakthrough (resulting in increased productivity).

In the analysis the CGE model first needs to establish a base case to which the results of various scenarios can be compared. This means there is a constant point of analysis between various scenarios. The base case (or baseline) is sometimes referred to as a business-as-usual scenario and is essentially what would happen in the absence of any significant shock. The model also needs a 'base' year (or starting point) and a 'snapshot' year to be defined. In this study, the base year is 2020 and the snapshot year is 2030. Essentially, the study is modelling the effect of a shock, such as an increase in the sorting rate in the post-consumer fashion sector, on the economy in 10 years' time (2020 to 2030).

Figure 1 shows how the CGE model results should be interpreted. The example of real GDP is used. First, the level of real GDP in the snapshot year (2030), noted as Y1 baseline, consistent with a baseline scenario needs to be established. Thereafter, the CGE model experiment proceeds by changing one (or more) of the assumptions that have been adopted to determine the baseline or control level of real GDP Y1 baseline. It is common to change only one assumption at a time so the impact of that change can be understood. If multiple assumptions are changed (sequentially), it is not possible to understand the individual impact of each change but the impact as a result of the interaction between the changed assumptions could be obtained. This approach is taken when the impact of a composite scenarios is studied.

Figure 1 Interpreting a computable general equilibrium (CGE) model experiment



If the sorting rate in the fashion sector were changed, then this is the 'shock' that is to be modelled. For such an experiment to be modelled, a variety of variables is likely to be changed to mimic the 'shock' being introduced into the model. In technical terms, a set of variables is not determined by the model – such variables are termed 'exogenous'. These variables must be set, or 'shocked', by the user, depending on the experiment or scenario being simulated. On the other hand, variables that are determined by the model are termed 'endogenous'. The outcomes for these variables are obtained as a result of solving the model's equations. This solution process occurs after the introduction of the shock, through changes to one or more exogenous variables, to the model. For example, the labour supply and input demands are likely to be different in the baseline compared with in the scenario. In addition, government consumption demand may be changed to reflect different, for example, environmental policy and spending associated with the changed flow of fashion products in the scenario. The result of the model's simulation (experiment) of the impact of sorting of post-consumer products would be a measure of the difference between Y1 *scenario* and Y1 *baseline*; that is, the difference between real GDP with shock (changed sorting rate) and real GDP without shock (baseline sorting rate).

The model provides results for a wide range of economic measures (e.g., labour employed, gross output by various sectors, exports by different products, and imports and consumer spending by product). Each of these results should be interpreted in a similar way to that depicted in Figure 1. An alternative way of interpreting the CGE model experiments is to view them as answering, 'what … if … ?' questions. For example, the question being answered would be, 'what is the change in real GDP and employment, if automation increased productivity in the fashion sector by x percent?'.

Generating a baseline scenario

As noted above, the model generates a baseline scenario. Such a scenario should be interpreted carefully and, in particular, should not be confused with a forecast. Such projections are entirely contingent on the assumptions adopted for the key variables used to underpin the scenario. Key variables for which assumptions are required to generate a baseline scenario include:

- technological changes being faced by industries and occupations (e.g., which types of inputs (occupation skills or equipment) are more likely to be used than others) – the more detail we can input about this, the more robust will be the model projections;
- demographics – growth in population, working population by gender, number of households, and the labour supply available;

- the relative rates of return and the savings to gross national product (GNP) ratio – assumptions on the savings to GNP ratio are required to establish the availability of the productive capital stock (physical machinery, equipment, buildings) for use by industry in the projection year;
- terms of trade – movements in the relative world prices of goods and services that producers are competing with on the global market.

The detailed assumptions imposed for the baseline projection/scenario are presented in Appendix 1, Charts 1 and 2.

The estimation of the baseline generates plausible predictions for key macroeconomic indicators which is the main purpose at this stage. Graphical representation of the indicators of interest can be found in the accompanying Appendix 3, Excel file, Sheet "comp1234" attached. Specifically, total production grows everywhere but most significantly in China due to increased trade with the USA. High-skill worker numbers increase mostly in China and USA, while low-skill worker numbers grow in India, Europe and RoW. The private and government consumption grows consistent with the patterns of production and trade, but the balance differs between China and the USA - in China the government consumption is higher, while in the USA, private consumption dominates. Factor earning growth is highest in China but skewed towards capital and way from labour – a pattern well-established in the existing literature concerning the general trend in the world economy.

Focusing on the fashion industry, which is defined as manufacturing, recycling and reuse aggregate sectors (see also Appendix 1, Chart 3 for graphical depiction), we observe and increase of high skill workers in the European manufacturing and recycling sectors. In India the growth of low skilled employment is the highest and comprises increases in all three fashion sectors, while in China low skill employment in the fashion industry is in decline. These observed changes are generally driven by respective changes in the relative wages, balancing supply and demand changes. In terms of trade (similar to production) in the fashion industry, growth in exports is dominated by manufacturing goods originating from India while exports from China and the USA are in decline. Consistent with this pattern labour earnings grow most in India's manufacturing (fashion) sector, while labour earnings in China decline. The increases in employment and labour earnings are associated with increases in female workers in Europe and in male workers in India, in both regions mostly in manufacturing.

Three scenarios

Outline

The fashion industry development scenarios presented in this report illustrate the impact on the 2030 economy as a result of different levels of technological progress (automation),

different sorting rates of post-consumer waste, and alternative assumptions on recycling and re-use rates. The experiments are grouped into three broad scenarios which are presented schematically in Appendix1, Chart 4 and summarised below.

2. **CHASING THE LOW COST (2030)**
    a. Low skilled labour is paid relatively lower wage in Africa/CSA /India
        i. Wages' change (all sectors in entire region)
    b. Robots continue to replace low skilled labour (mostly in USA/EUR/China)
        i. Canonical parameter for augmented technology change
        ii. Could also covid cause automation to increase
    c. Tax incentives to attract production back in the West countries (USA/EUR)
        i. Production tax variable
    d. Structural changes in employment sector (labour migration within regions)
        i. As demand for skilled labour grow wages also
    e. Employment of women varies; gender is included to the presentation of results
        i. What fraction of females/males joining in 10 years to labour market in each region?
    f. Domestic work done by female move a fraction away from labour market
    g. All in one

3. **FASTER AND GREENER (2030)**
    a. High sorting-recycling-reuse rates go up (larger improvements in CHN, IND & ROW)
        i. Rates move up specificly for textile and recycling sectors
    b. Consumer preferences change toward second-hand cloth (or new Worn Again cloth)
        i. Changing share of composite good for consumers
    c. Technology shift from 'dirty' to 'clean' energy sources
        i. new structure is added
    d. All in one

4. **RISE OF THE REGIONS**
    a. Medium sorting-recycling-reuse rates go up (larger improvements in CHN, IND & ROW)
    b. Formation of regional supply chains
        i. imported input substituted to domestic one exogenously
    c. Consumer preferences shift toward regionally made goods (as imports more costly)
        i. Armington parameter
    d. International transport costs are relatively higher as in-land costs
        i. Transport margins change
    e. Regions use artificial barriers against each other to redirect trade flows
        i. Tariff change
    f. All in one

The specific values of shocks (sorting-recycling-reuse rates) are reported in Appendix 4 (Excel file attached).

As stated in previous section, the impacts are described as changes relative to the baseline change of a range of economic measures for 2030. The baseline can be interpreted as a business-as-usual scenario and assumes average-annual-rate projections for relevant variables. Productivity and trade conditions in the baseline are assumed to be similar to that experienced over recent years. The baseline projects GDP growth at an average 3.1 percent per annum (within two standard deviations) over the period of analysis with full-time equivalent employment growth of the order of 1.5 percent per annum.

Summary of results

Chasing the low cost: Relative to the baseline majority of the results generated by this scenario appear with a similar magnitude but in the opposite direction. Graphical representation of the indicators of interest can be found in the accompanying Appendix 3, Excel file, Sheet "comp1234" attached. Specifically, total production grows everywhere (except in RoW) but most significantly in Europe while the USA's trade is reduced; overall the scenario represents a picture of regionalisation. High-skill worker numbers mostly decline, especially in China, while low-skill worker numbers grow in China and the USA. The private and government consumption still grows in China and the USA but with smaller rates, as the investment is also at lower rate, especially in the USA where it turns negative in several industries. Factor earning are generally at negative rates, both for capital and labour, especially for capital in China. This pattern suggests a restoration in the balance of returns to capital and labour.

Focusing on the fashion industry (manufacturing, recycling and reuse), we observe no changes in high skill workers except a reduction in the European manufacturing and recycling sectors, just opposite to the baseline. In India the reduction of low skilled employment is the highest (in all three fashion sectors), while in Europe as well as other regions (except India) low skill employment in the fashion industry increase. The increase in the reuse industries in China, USA, and RoW is noteworthy. As before, these observed changes are generally driven by respective changes in the relative wages, balancing supply and demand changes. In terms of trade in the fashion industry, it is in decline with manufacturing goods exports from India showing a notable reduction as only RoW registers increase in exports. Production appears more regionalised with reuse industries output growing most in China. Consistent with this pattern labour earnings decline most in India's manufacturing (fashion) sector, while labour earnings in China increase, particularly in the reuse sector. The increases in employment and labour earnings are associated with decline in female workers in Europe and in male workers in India, in both regions mostly in manufacturing. In Europe there is some increase in male manufacturing workers, partially compensating the lost female employment.

Faster and greener: Relative to the baseline, majority of the results generated by this scenario appear mixed in terms of magnitude and sign. Graphical representation of the indicators of interest can be found in the accompanying Excel file, Sheet “comp1234”. Specifically, total production grows everywhere quite significantly (in Europe growth is modest) while the USA’s trade is significantly increased. The effects described are mostly driven by high rates of automation, leading to high productivity. This trend, in turn, increases demand in the input markets. High-skill worker (technicians performing mostly routine tasks) numbers decline in China and the USA but grow in other regions. Low-skill worker numbers grow in the USA and China but decline else ware. The private and government consumption grows mostly in China, the USA, and Europe but also in the RoW, with more equal rates, as the investment is also at positive rates, especially in the USA and China. Factor earning are generally positive (except in China), both for capital and labour, especially for capital in the USA. This pattern suggests a disparity in returns to capital and labour as established in the relevant recent literature.

Focusing on the fashion industry (manufacturing, recycling and reuse), we observe no changes in high skill workers except a reduction in the European manufacturing and recycling sectors, while there is more uniform increase in high-skill employment in the reuse sector, especially in Europe and RoW. In India the reduction of low skilled employment is the highest (in all three fashion sectors), while in China low skill employment in the fashion industry increase with other regions showing a mixed picture. The increase in the reuse industries in China and the USA is noteworthy. These observed changes are generally driven by respective changes in the relative wages, balancing supply and demand changes. Production grows mostly in China, while there is a substantial decline in manufacturing output in India, and more modest one in Europe and RoW. In terms of trade in the fashion industry, exports show a mixed picture with manufacturing goods exports from China showing an increase while from India there is a decline; notable is the rise in the exports of reuse industries from RoW. Consistent with this (production) pattern labour earnings decline most in India’s manufacturing (fashion) sector, while labour earnings in China increase, particularly in the reuse sector. The increases in employment and labour earnings are associated with decline in female workers in Europe and in male workers in India, in both regions mostly in manufacturing. In China there is increase in both male and female workers, in roughly similar rates.

Raise of the regions: Relative to the baseline, majority of the results generated by this scenario appear mixed in terms of magnitude and sign, but overall the effects are more similar to the “Chasing the low cost” scenario than the “Faster and greener” one. Graphical

representation of the indicators of interest can be found in the accompanying Excel file, Sheet “comp1234”. Specifically, total production grows everywhere (except in China) as in Europe and RoW growth is most significant. The effects described are mostly driven by decline in trading, especially between China and the USA. High-skill worker numbers decline in China but grow in Europe. Low-skill worker numbers grow is just opposite to the high-skill worker pattern. The private and government consumption grows mostly in China, the USA, and Europe, with more equal rates, however the investment is at negative rates. Factor earning are generally small and with mixed sign, except in China where capital earnings are quite large negative. This pattern suggests a disparity in returns to capital across regions and the role of trade, especially for China.

Focusing on the fashion industry (manufacturing, recycling, and reuse), we observe no changes in high skill workers except a reduction in the European manufacturing and recycling sectors, while there is more uniform increase in high-skill employment in the reuse sector, especially in the USA, Europe, and RoW. In India the reduction of low skilled employment is the highest (especially in manufacturing), while in China low skill employment in the fashion industry increase with other regions showing a a similar picture, except the reuse industry in Europe which shows decline in low-skill employment. These observed changes are generally driven by respective changes in the relative wages, balancing supply and demand changes. Production grows mostly in China, while there is a substantial decline in manufacturing output in India, and more modest one in Europe. The increase in the production of the reuse industry, especially in China is noteworthy. In terms of trade in the fashion industry, exports show a mixed picture with manufacturing goods exports from China showing an increase while from India there is a decline. Consistent with this (production) pattern labour earnings decline most in India’s manufacturing (fashion) sector, while labour earnings in China increase, particularly in the reuse sector. The increases in employment and labour earnings are associated with decline in female workers in Europe and in male workers in India, in both regions mostly in manufacturing. In China there is increase in both male and female workers, but the rates of increase are larger for male workers. Overall, there is male worker increase in the reuse sector in most regions.

The environmental effect in a nutshell

To capture the effect of economic activity on the environment we monitor a total (CO_2) emission indicator across the tree scenarios. Relative to the baseline, most positive impact on the environment is observed when “Rise of the regions” scenario is implemented, with reduction in emissions by 160% in China and no increases in other regions. A similar but smaller impact is observed from “Chasing the low cost” scenario where the reduction of emissions in China is about 100%. Interestingly, “Faster and greener” produces increases in

emissions in the USA and RoW of about 160% each and 50% increase in Europe. This (unexpected) effects are due to the accelerating impact that increase in automation generates leading to increase in productivity, production and demand for inputs, all together resulting in significant expansion of economic activity. The effect of sorting (and recycling and reuse) rate increase generates a similar mechanism as in the case of automation. The main implication of the findings concerning emissions is that increasing automation and/or implementing environmentally friendly policies such as sorting, and recycling incentives would lead to more pollution without managing a comprehensive structural change in the supply (and demand) side of the economy. Structural change should involve new production processes altogether and new approaches to production and consumption. Admittedly, in our modelling framework (a standard CGE) structural changes are not introduced and considering the modelling time frame structural change happening is unrealistic proposition.

Summary of how fashion industry developments impact the economy

Developments in the fashion industry such as circular fashion (and the opposite case of fast fashion) have impacts on both demand and supply sides of an economy (see also Appendix 3 for channels of impact). Thus, it is critical that investigations are undertaken using economy-wide models that capture the interaction of both sides of the economy. The investigation should also capture responses to changes in prices (including wages) prompted by different levels of sorting rates, and the related recycling and reuse rates, as well as the rate of automation. In this sense, the CGE model is an ideal tool to analyse the impact of alternative fashion industry scenarios. However, using multiple shocks in a scenario makes it theoretically impossible to identify every single (independent) effect and what is possible is to observe and discuss the overall impact that a set of shocks associated with each particular scenario generates.

Thus, the overall economic impact of fashion industry developments comprises a balance between the impacts on the demand side and the supply side. In an increased automation and greening scenario, the additional supply for goods and services arises from the higher productivity and additional resources involved in combining with the increased recycling and reuse intensities of post-consumer waste. This additional supply (and demand for inputs) may be modified according to the fashion sectors' composition. On the demand (for inputs) side, additional productive resources in the form of various types of labour will be required. This additional labour will also modify the relative wages and skill composition in the labour market. Besides the product supply-side effects discussed so far, there will also be a demand for (new and existing) product changes. These are likely driven by both changes in relative process and (simulated) preferences for environmentally friendly products.

The combination of additional demand for goods and services and additional labour resources and skills (as simulated in the baseline) will require, simultaneously, additional machinery, equipment, buildings, and other productive capital. This further requirement will be reflected in increased demand for investment goods. On the one hand, household and investment demands for goods and services are increased. In particular, sectors associated with the production and supply of physical capital resources (investment goods) will benefit from the increased demand for such resources. On the other hand, the additional labour and capital attracted to the fashion industry will be able to supply more goods and services. The balance between these two impacts will determine changes in prices, and so set off further consequential impacts.

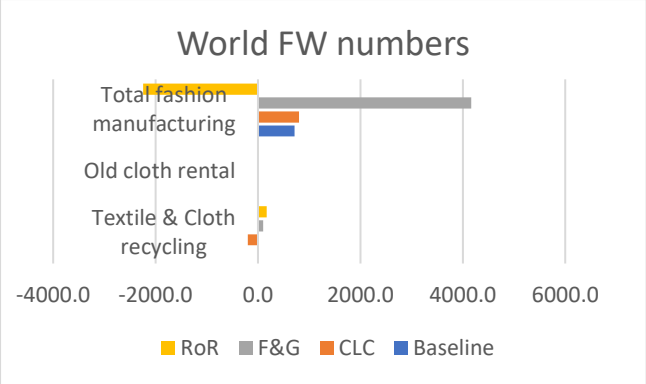
Analysis of CGE results by region: the global fashion industry

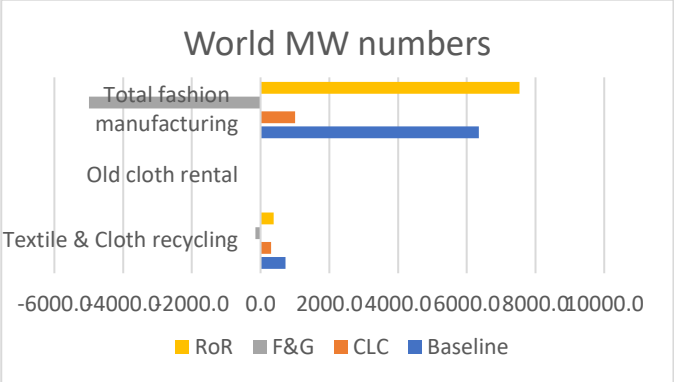
The focus of this analysis is the fashion industry's global aggregate characteristics.

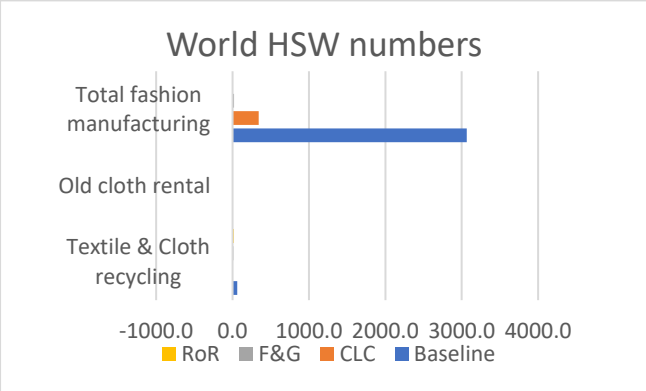
General propositions: The theoretical basis of the analysis of employment effects is the conditional labour demand function. Conditional labour demand function implies that changes in employment will generally be positively correlated with changes in production (and productivity) and negatively correlated with changes in wages. In turn, wages adjust to an equilibrium level where demand and supply of labour are equalised. In our CGE framework the main factors associated with our three scenarios (CLC, F&G, RoR) affecting employment and wages are the rate of technological progress, offshoring/reshoring trends, and wage policies affecting the cost of labour. The three scenarios represent differing combinations of these factors which determine outcomes. Alongside the three fundamental factors, we also implement fashion-sector specific shocks capturing effects of the circular fashion trends with differing intensity: sorting rate and recycling/rental proportions. Alongside each of the three scenarios, results from the baseline projection are also reported.

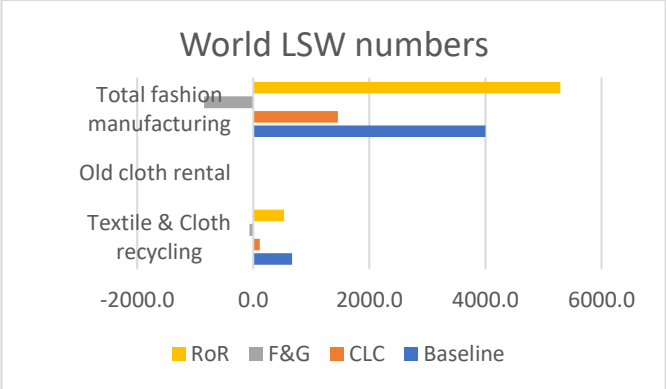
Notation and abbreviations: FW – female workers; MW – male workers; HSW – high skill workers; LSW – low skill workers; FManu – fashion manufacturing; Recycle – recycling, sorting resale; Rental – clothing rental; Total fashion … - fashion manufacturing; AS – all sectors. All figures show changes from base year, today.

Employment (number) and wages (%) changes from base year (today)









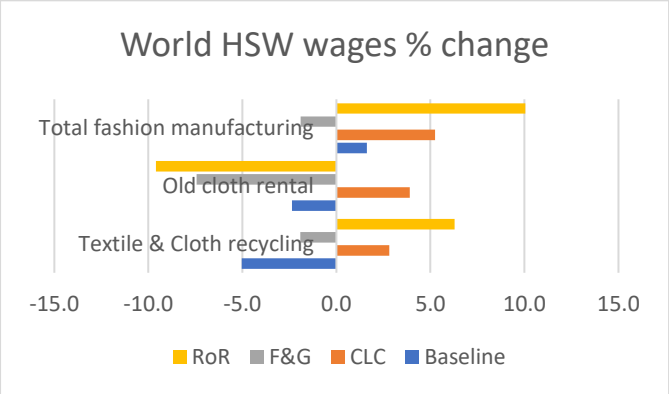
Employment effects

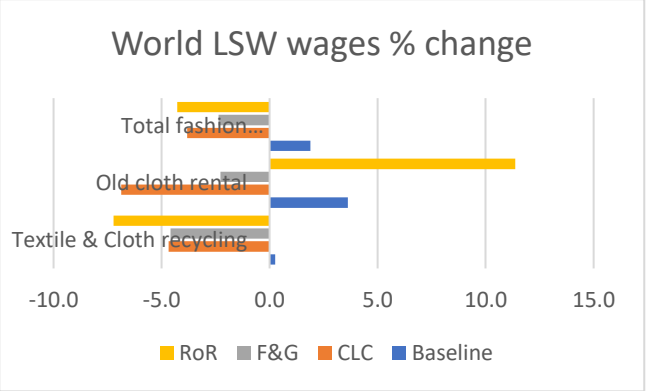
The three scenarios and the baseline produce heterogeneous effects on the global fashion industry. In this discussion of results we highlight the most notable effects: i/ the baseline produces, for most indicators analysed, changes that are as large as the scenario effects, and in general in the same direction; ii/ considering the three fashion sectors, the largest of them is fashion manufacturing and it witnesses the larges change in number of workers, especially low skill workers who appear to be men (total change in the baseline is over six million); iii/ the second in overall size and in changes in number of workers is the recycling (including sorting and resale) sector. Again, the change is associated with low skill and men workers as the magnitude is only under one million for the baseline; iv/ another regularity is the difference in the magnitudes of change between women and men at the baseline. A notable exception is the F&G scenario which generates increase in women worker numbers of over four million, while the men worker numbers decline with almost five million. Opposite changes are observed in the RoR scenario with the increase in men jobs more than three-fold the decline in women jobs. These findings can be important for gender inequality. If changes are in opposite direction across genders, as in the case of F&G scenario, there would be a convergence given that the number of formal women jobs is lower than men jobs number. If changes are in the opposite direction though as in the R0R scenario, an increase in inequality could be expected; v/ from the three scenarios, RoR scenario leads to the largest increases in worker numbers, specifically for men and low skill jobs; vi/ F&G scenario produces smaller aggregate changes in magnitude, especially by skill type but also ones associated with relatively large decline in men worker numbers and increase in women worker numbers in manufacturing; vii/ The CLC scenario also does not have a significant aggregate impact on the world fashion industry compared to other scenarios and the baseline; viii/ there is no notable changes in jobs in the small rental sector

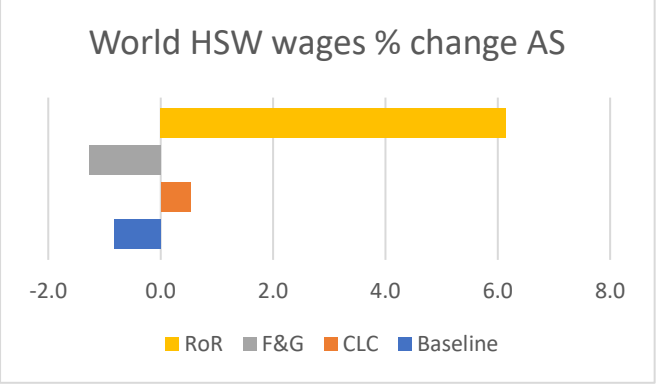
when the aggregate world fashion industry is considered, however, we did find some more pronounces heterogeneity at a regional level.

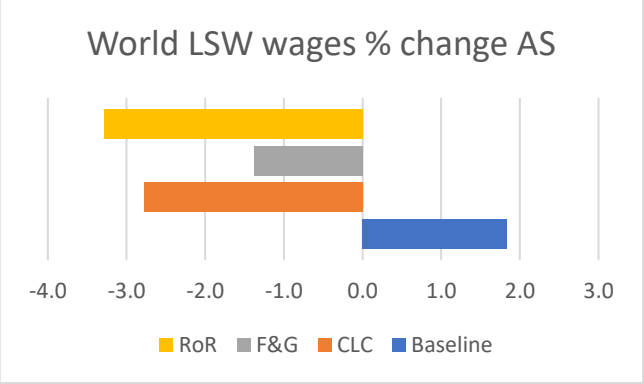
Linkages with sectors from the broader economy

The sectors with bigger changes in women employment whit which fashion sector may interact are **business services (other)** (CLC, F&G, RoR), **wholesale and retail trade** (CLC, F&G, RoR), and agricultural production (CLC, F&G), manufactured products (other) (F&G, RoR). For men employment the diversity of sectors in the broader economy is higher; sectors that grow substantially are **agricultural production** (CLC, F&G, RoR), **wholesale and retail trade** (CLC, F&G, RoR), processing food products (CLC, RoR), business services (other) (CLC, F&G), transport services (F&G), manufactured products (other (F&G, RoR), mining extraction (F&G). For both genders a source is also the population growth which may well contribute over 50 million workers per year.









Wage effects

The baseline presents smaller magnitude of change compared to the three scenarios. The notable points are: i/ wages of high skill workers increase over time, while low-skill wages decline as the average magnitude of change is somewhat large in the case of high skill wages; ii/ despite the general trend identified in previous point, there is substantial heterogeneity in both types of wages

across scenarios. For example, F&G scenario produces reduction in both HSW and LSW wages of similar magnitude. RoR scenario produces a mixed picture where HSW wages mostly increase and LSW wages decline, exception being the rental sector. CLC produces a clear pattern where HSW wages increase while LSW wages decline; iii/ generally, the increase in high skill wages combined with no significant changes in employment suggests relative excess demand for high skill workers; iv/ the opposite relationship observed in the case of low skill wages suggests a relative excess supply (or rigidity of demand) of low skill workers; v/ in the F&G scenario where employment in low skill occupations declines, while wages also decline the interpretation is that relative (to demand) excess supply (or rigidity of demand) drives the equilibrium.

Comparing with the wage changes in the whole economy, the wage change patterns in the fashion sector resemble the changes in the whole economy but with a larger magnitude (up to twice larger in the case of both HSW wages and LSW wages). This suggests *higher volatility* in the wages in the fashion sector relative to the rest of the economy which has important policy implications.

Appendix 1

Chart 1

UPDATED MODEL

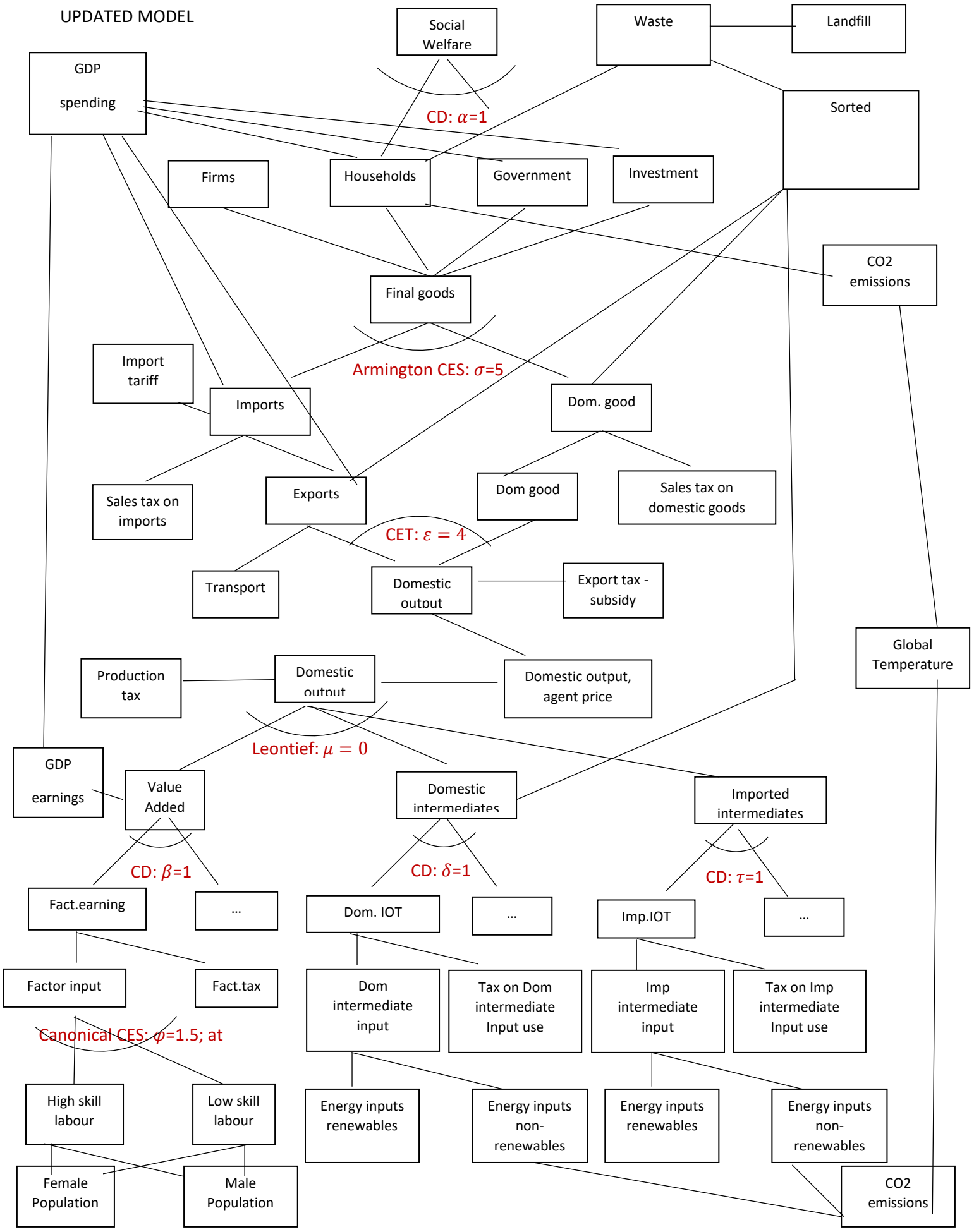
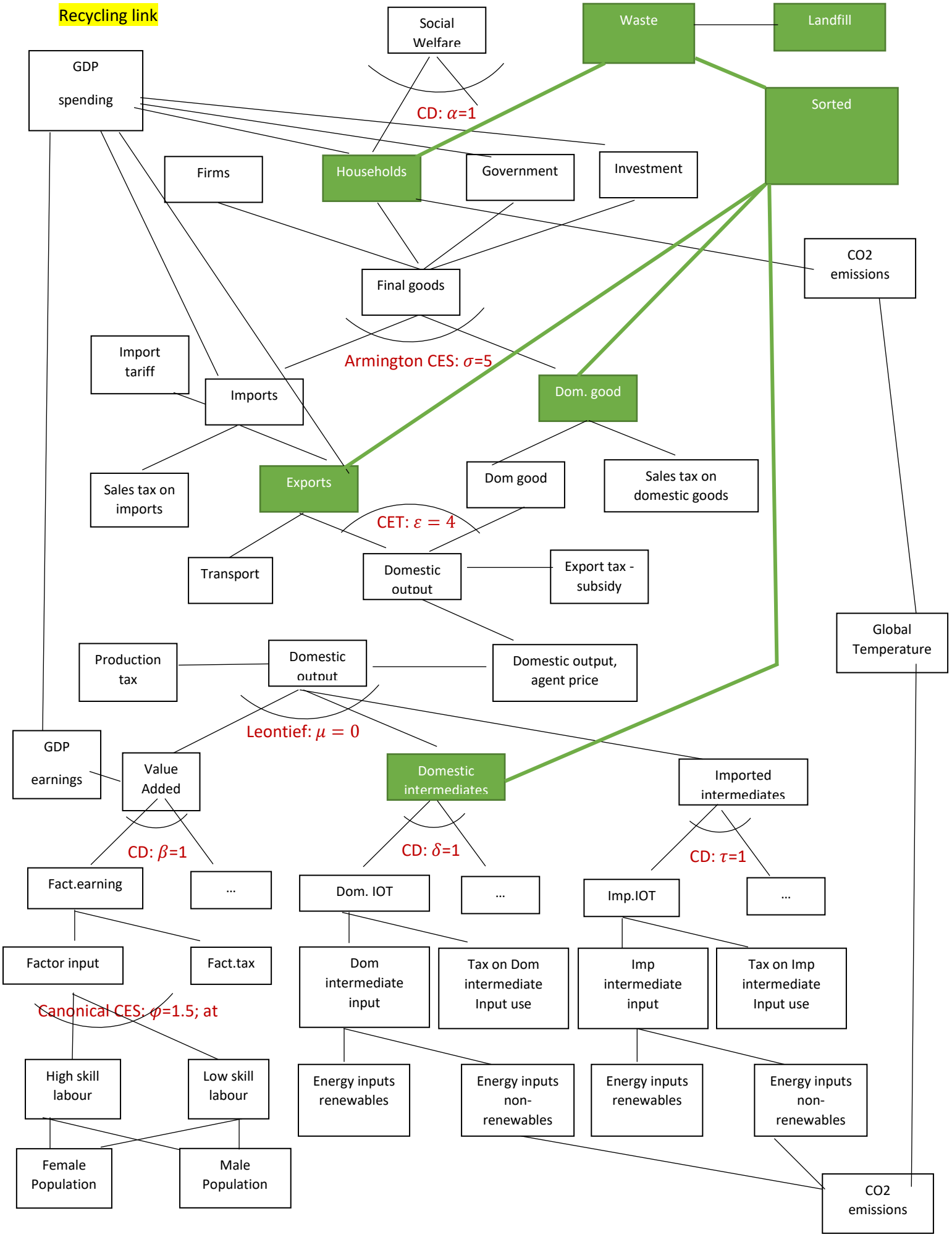
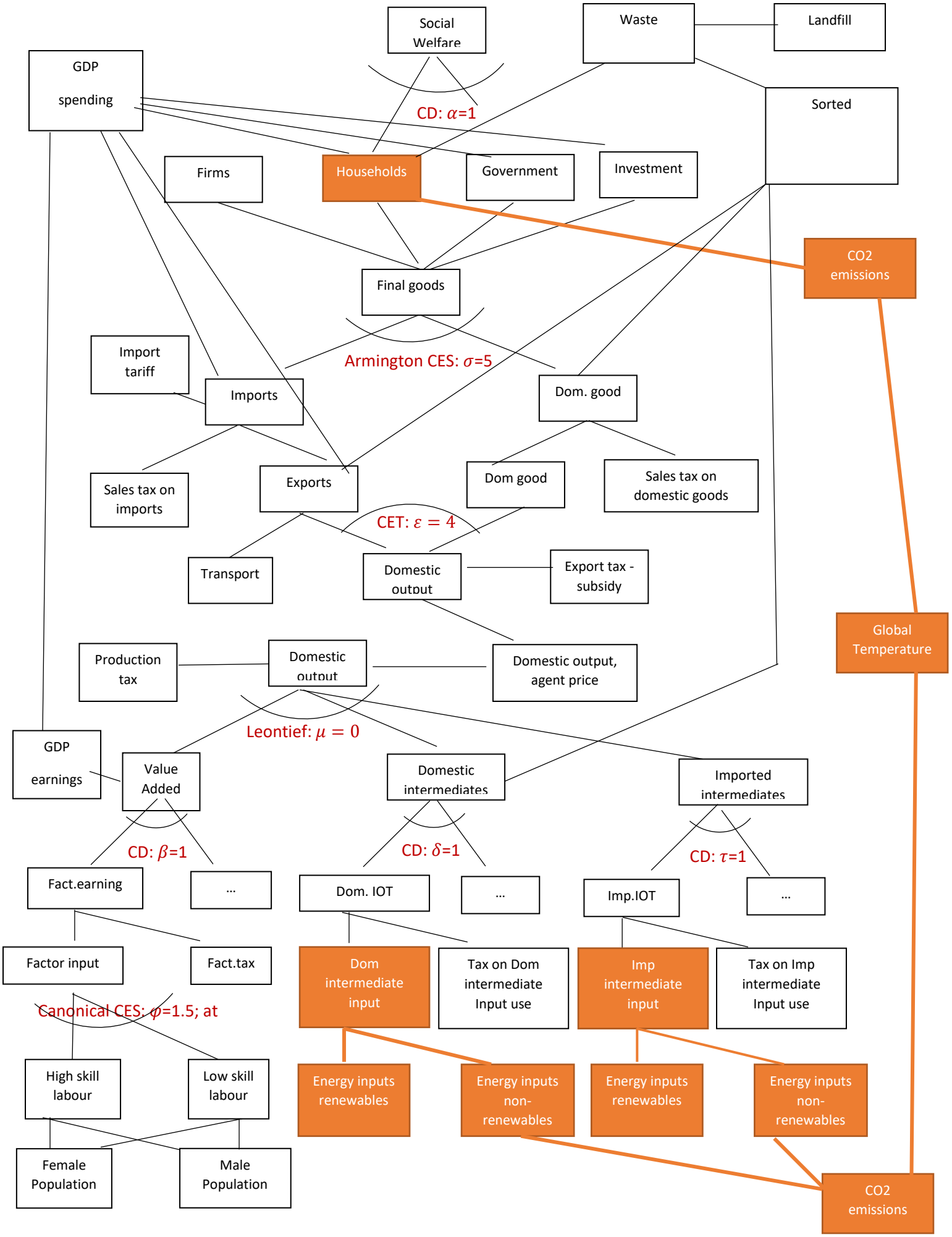
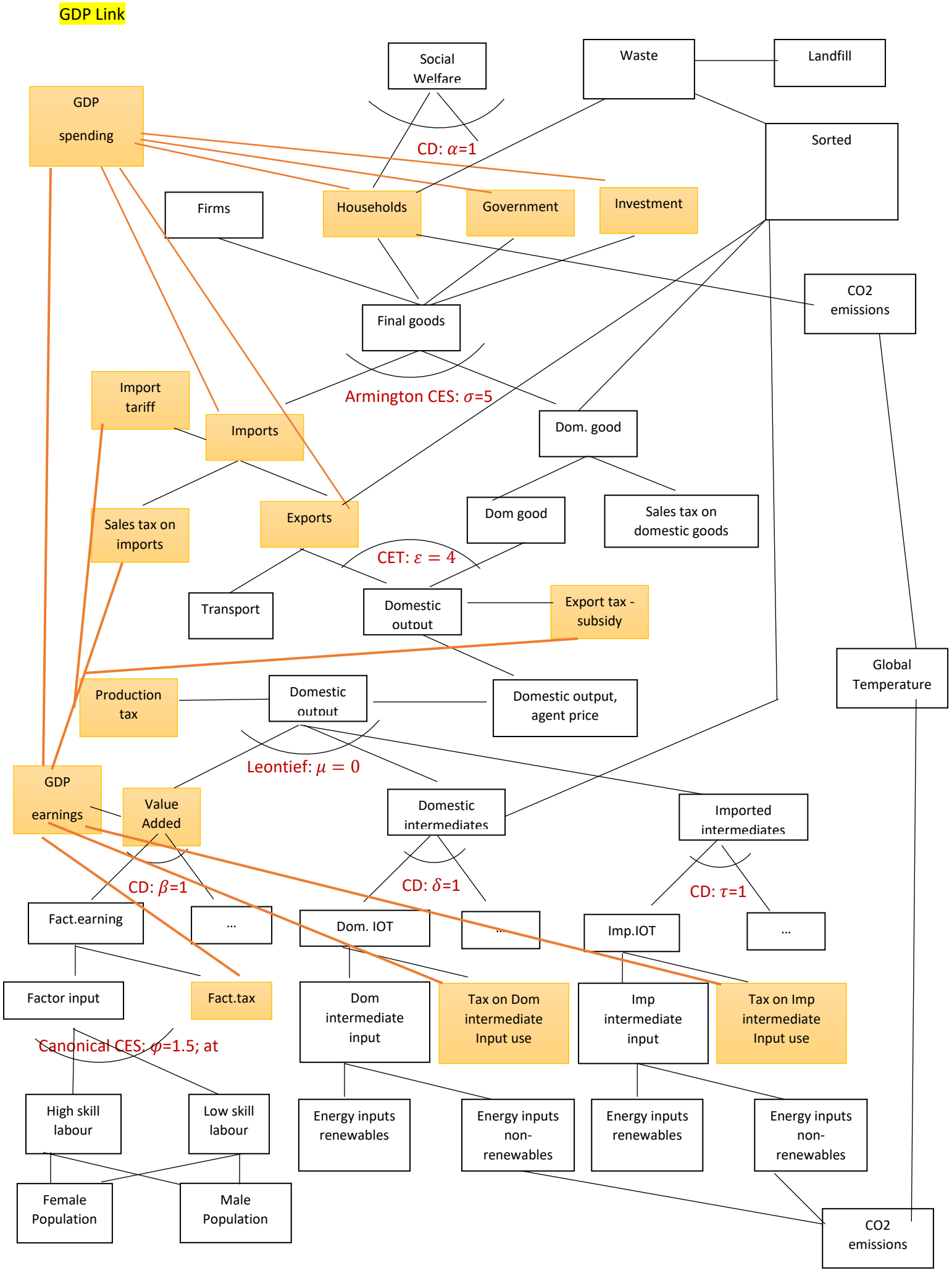


Chart 2


Recycling link
Social Welfare
Waste
Landfill
GDP spending
CD: α=1
Sorted
Firms
Households
Government
Investment
CO2 emissions
Final goods
Import tariff
Armington CES: σ=5
Imports
Dom. good
Sales tax on imports
Exports
Dom good
Sales tax on domestic goods
CET: $\varepsilon = 4$
Transport
Domestic output
Export tax - subsidy
Global Temperature
Production tax
Domestic output
Domestic output, agent price
Leontief: $\mu = 0$
GDP earnings
Value Added
Domestic intermediates
Imported intermediates
CD: β=1
CD: δ=1
CD: τ=1
Fact.earning
...
Dom. IOT
...
Imp.IOT
...
Factor input
Fact.tax
Dom intermediate input
Tax on Dom intermediate Input use
Imp intermediate input
Tax on Imp intermediate Input use
Canonical CES: φ=1.5; at
High skill labour
Low skill labour
Energy inputs renewables
Energy inputs non-renewables
Energy inputs renewables
Energy inputs non-renewables
Female Population
Male Population
CO2 emissions

CO2 & Energy Link




GDP Link
Social Welfare
Waste
Landfill
GDP spending
CD: α=1
Sorted
Firms
Households
Government
Investment
CO2 emissions
Final goods
Armington CES: σ=5
Import tariff
Imports
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CD: β=1
CD: δ=1
CD: τ=1
Fact.earning
...
Dom. IOT
...
Imp.IOT
...
Factor input
Fact.tax
Dom intermediate input
Tax on Dom intermediate Input use
Imp intermediate input
Tax on Imp intermediate Input use
Canonical CES: φ=1.5; at
High skill labour
Low skill labour
Energy inputs renewables
Energy inputs non-renewables
Energy inputs renewables
Energy inputs non-renewables
Female Population
Male Population
CO2 emissions

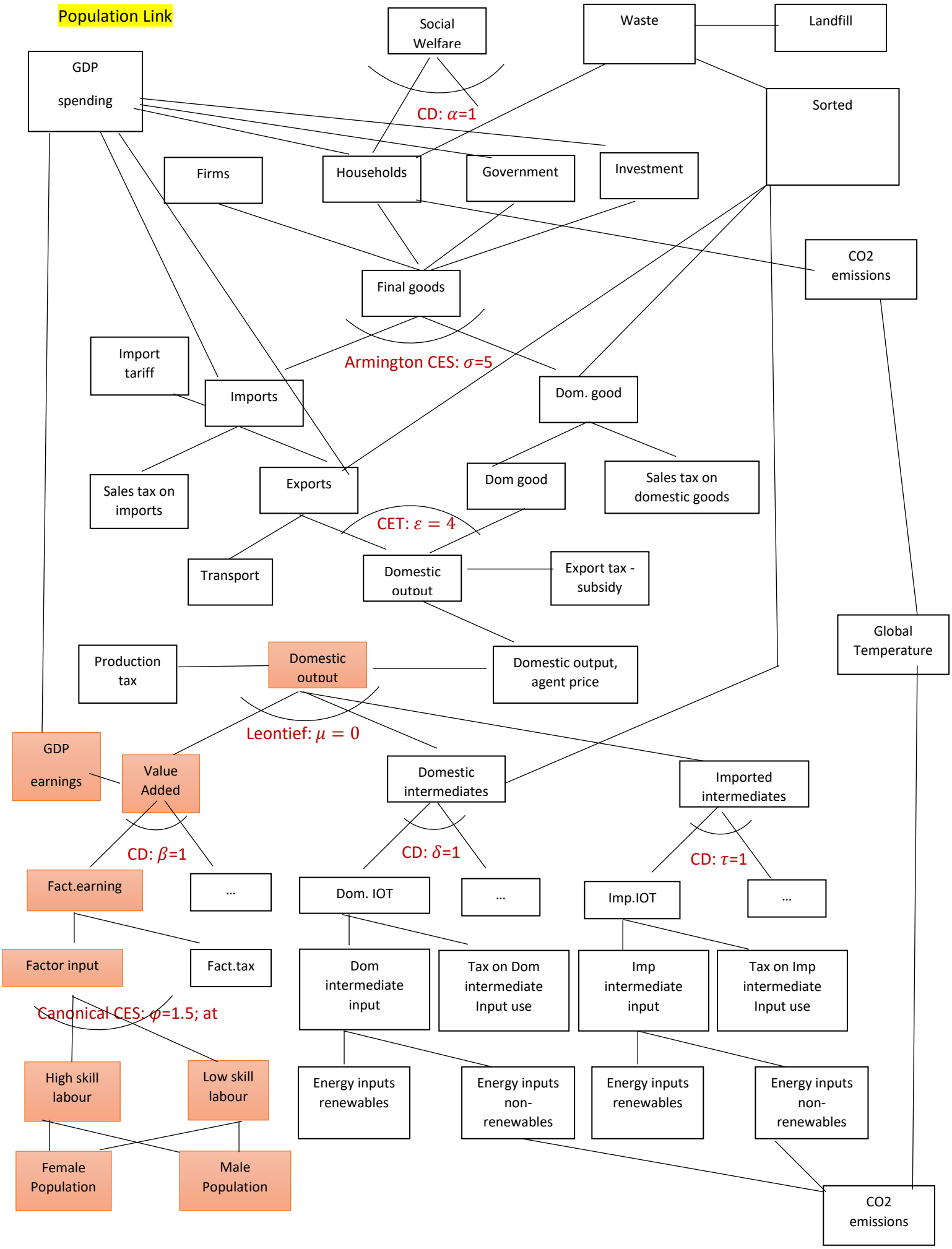

Population Link
Social Welfare
Waste
Landfill
GDP spending
CD: α=1
Sorted
Firms
Households
Government
Investment
CO2 emissions
Final goods
Armington CES: σ=5
Import tariff
Imports
Dom. good
Sales tax on imports
Exports
Dom good
Sales tax on domestic goods
CET: $\varepsilon = 4$
Transport
Domestic output
Export tax - subsidy
Global Temperature
Production tax
Domestic output
Domestic output, agent price
Leontief: $\mu = 0$
GDP earnings
Value Added
Domestic intermediates
Imported intermediates
CD: β=1
CD: δ=1
CD: τ=1
Fact.earning
...
Dom. IOT
...
Imp.IOT
...
Factor input
Fact.tax
Dom intermediate input
Tax on Dom intermediate Input use
Imp intermediate input
Tax on Imp intermediate Input use
Canonical CES: ϕ=1.5; at
High skill labour
Low skill labour
Energy inputs renewables
Energy inputs non-renewables
Energy inputs renewables
Energy inputs non-renewables
Female Population
Male Population
CO2 emissions

Chart 3: The circular fashion sectors

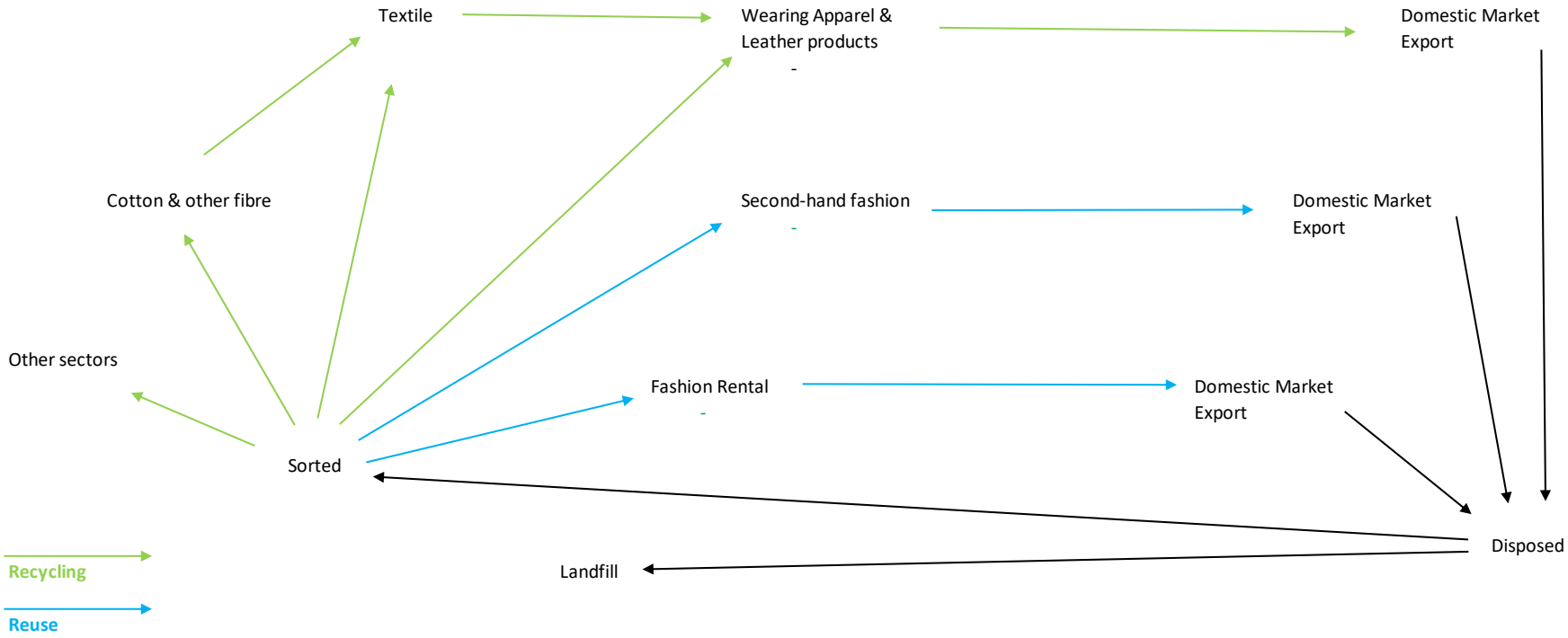
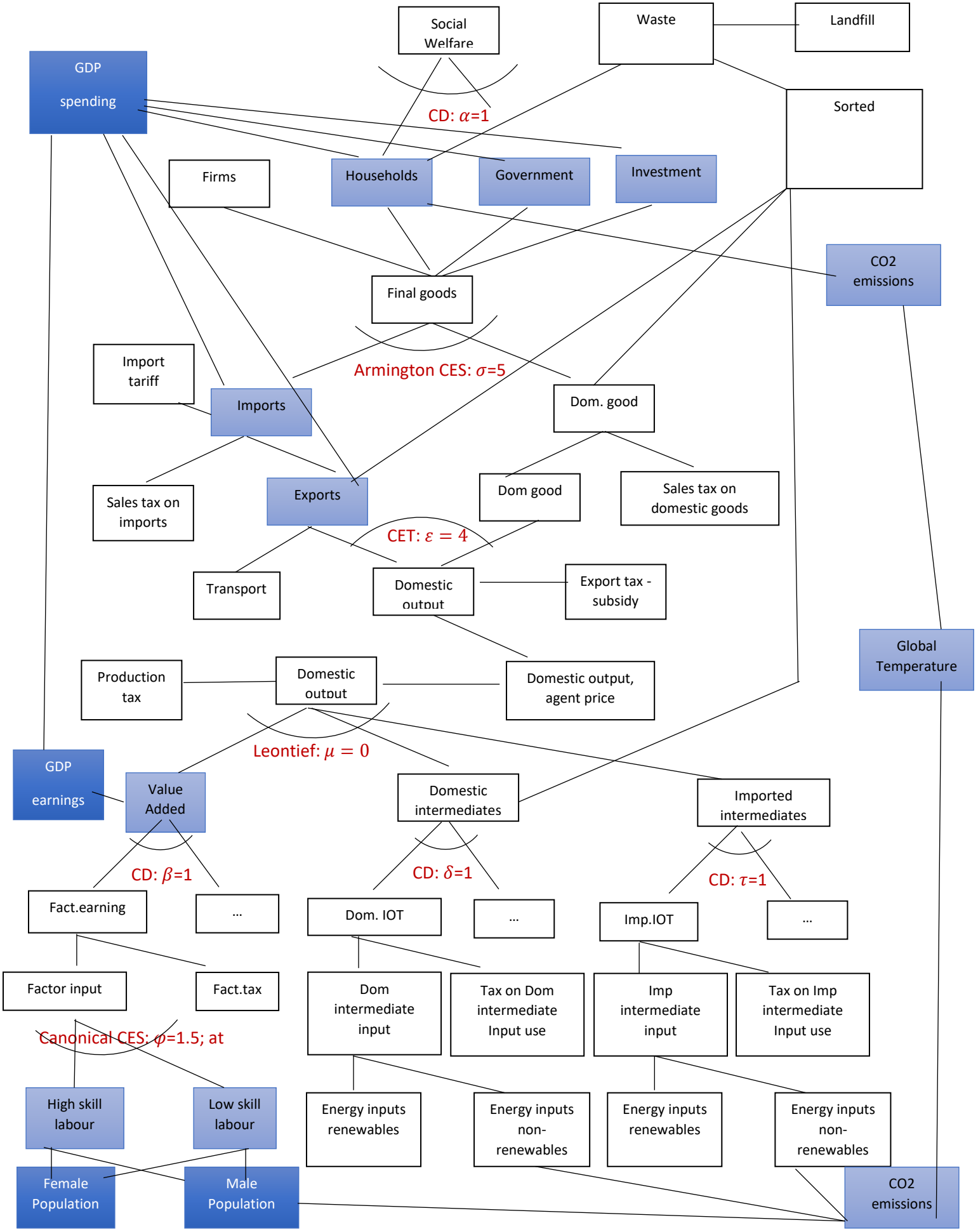
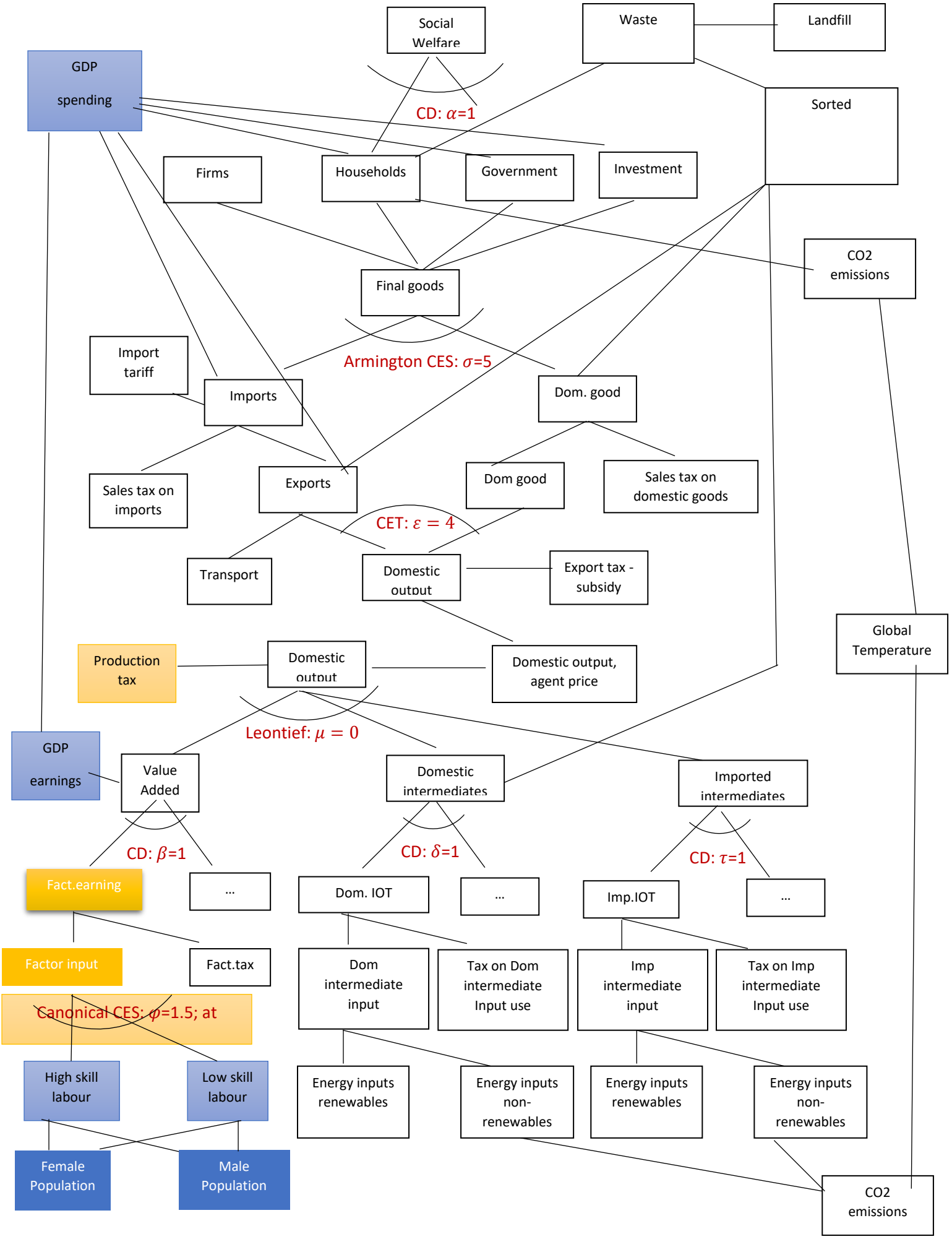


Chart 4

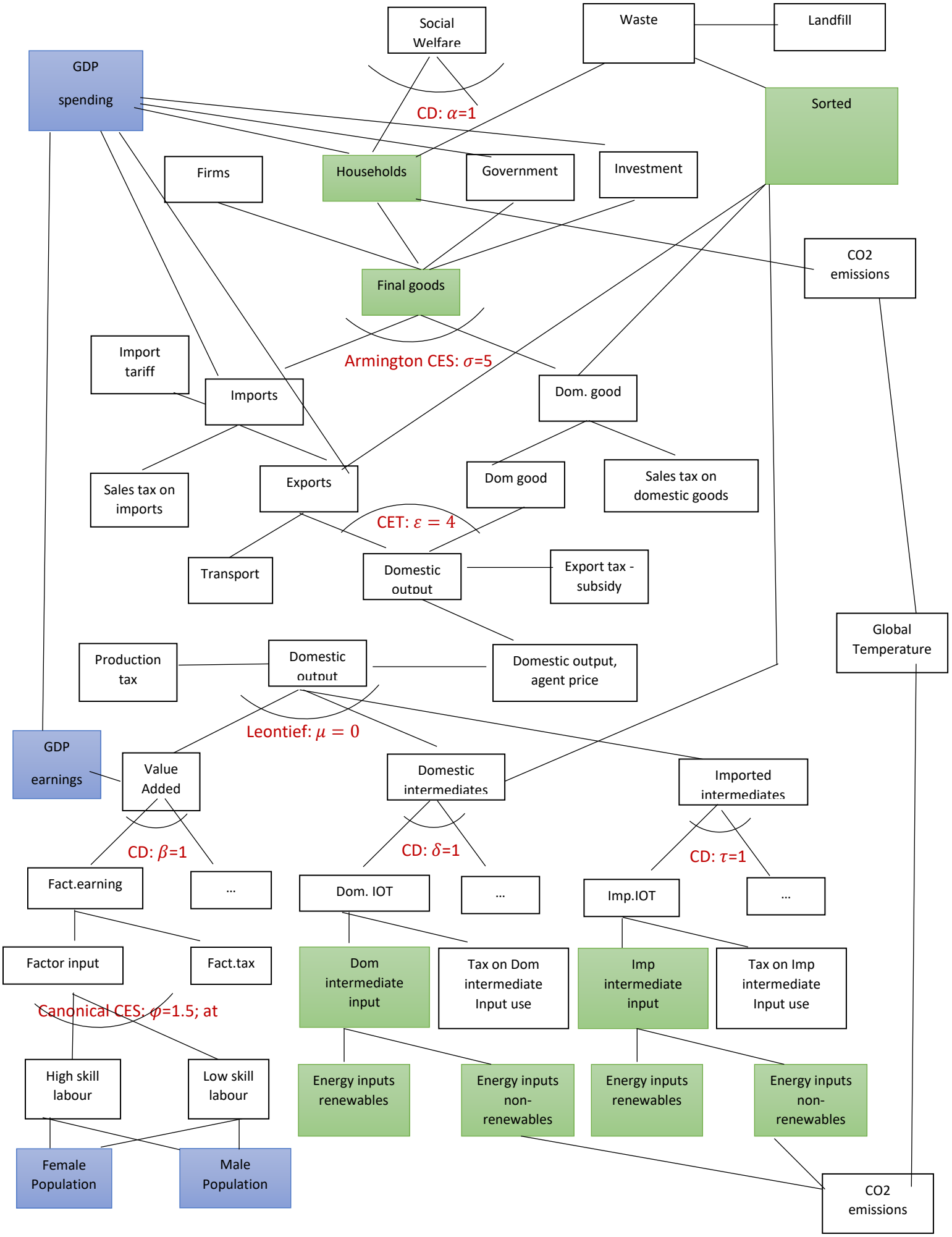
BASELINE



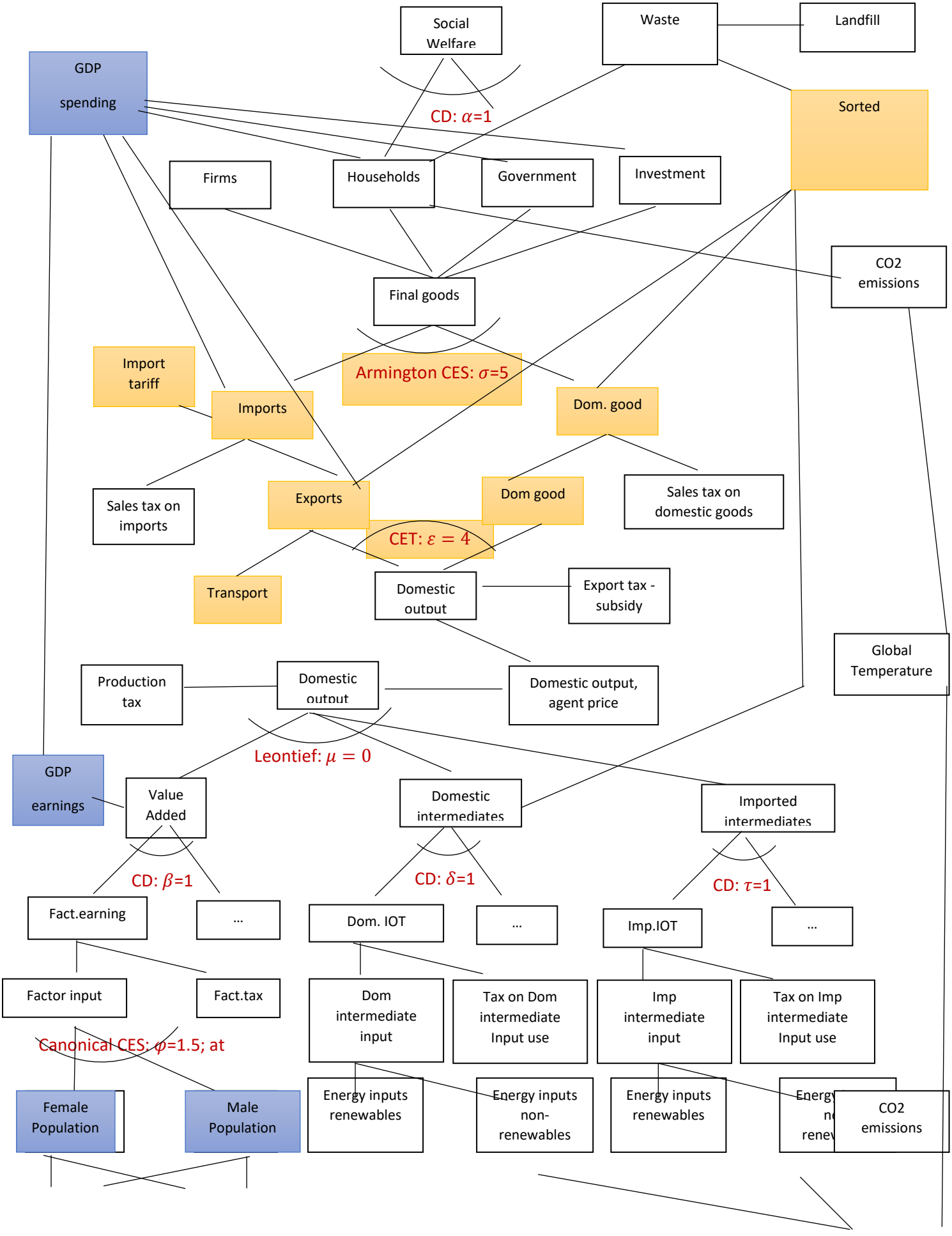
LOW-COST LABOUR



FASTER & GREENER



REGIONAL SUPPLY CHAIN



Appendix 2 (to be added)

Appendix 3 (Excel file with sorting etc. rates attached)

Appendix 4 (Excel file with Baseline and Scenario results attached)