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An Alternative to the Carbon Border Adjustment Mechanism

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Econ 039: International Trade

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Introduction

In 2018, the Intergovernmental Panel on Climate Change published a special report supported by over 6,000 references emphasizing the "clear benefits" of limiting warming to 1.5°C above pre-industrial levels as opposed to 2°C. In order to achieve this feat, there must be intensive efforts to decrease greenhouse gas emissions (GHGs) by 2030. At the current rate of warming, this 1.5°C figure will be reached sometime between 2030 and 2052. Without proper mitigation measures, global temperatures will continue to rise, further disrupting ecosystems, low-lying coastal communities, food security, water supply, and economic growth.[1]

One potential avenue for reducing global GHG emissions lies in carbon pricing, a system that helps place some of the burden of reducing emissions back into the hands of the producers widely responsible for it. Putting a price on carbon provides incentive for producers to find greener methods of production, and it is an essential step to increasing climate action.[2] Carbon pricing can be implemented either via a carbon tax with a directly set rate or via an emissions trading system (ETS) that places a cap on the total level of GHG emissions, allowing producers to trade their allowances with other emitters.[3] In 2022, over 30% of world emissions were subjected to carbon pricing although price per ton continues to vary greatly. Whereas the global average lies at $6 per metric ton of CO_2 produced, prices in the European Union far exceed this figure at upwards of $90 per metric ton.[4]

In 2020, the European Commission approved the European Green Deal, a plan that aims to achieve European climate neutrality by 2050, effectively turning climate activism into a legal obligation. More urgently, the 'Fit for 55' package attempts to cut EU greenhouse gas emissions by 55% relative to 1990 levels by 2030.[5] Although the European Union's ETS, the world's first, has been functioning successfully since 2005 carbon pricing exposes the EU to one major

problem.[6] Carbon leakage is the process by which carbon-intensive production shifts to regions without carbon regulation, negating efforts to reduce GHG emissions and in some cases even increasing global emissions.[7] Additionally, lack of regulation provides these regions with an artificial comparative advantage, improving their terms of trade relative to the EU.[8] Maintaining that policy solutions are a necessary tool in the fight against climate change, the EU must decide how policy can be implemented to reduce global emissions while simultaneously avoiding carbon leakage and economic disadvantage.

Policy Solutions and their Associated Outcomes

1. *Carbon Border Adjustments*

On May 10, 2023, EU co-legislators signed the carbon border adjustment mechanism (CBAM) regulation which will enter its transitional phase later this year on October 1, 2023. The CBAM seeks to mitigate carbon leakage while simultaneously distributing some of the burden of reducing GHG emissions to other countries that produce them. The mechanism ensures that the carbon price that imported goods are subjected to is equal to the carbon price paid in domestic production by imposing tariffs on imported carbon-intensive goods.

If foreign producers can prove that they have already paid a carbon price on the goods that they are exporting to the EU, their products are then subject to either a reduced tariff or no tariff at all depending on the value of the carbon price previously paid. Alternatively, foreign producers can purchase CBAM certificates priced on weekly ETS allowances that correspond with the emissions embedded in their imports.[9] Countries are incentivized to create and collect carbon taxes of their own so that tax revenue remains domestic rather than being transferred to the EU via tariff revenue. Although the CBAM may successfully cut down on carbon emissions and prevent carbon leakage, there is widespread concern that it may violate the WTO's

most-favoured-nation (MFN) principle, treating countries differently based on their respective policies. This discrimination may benefit some EU importers and hurt others, working to prevent climate change at the expense of foreign nations.[8]

2. *Basic Trade Model Analysis*

The distortion of international trade that may result from the CBAM can be shown using the Basic Trade Model (BTM). With this model, goods are separated into two categories: carbon-intensive and non-carbon-intensive goods. In this essay, carbon-intensive goods will hereafter be referred to as good X and non-carbon-intensive goods will be referred to as good Y. Good X will be expressed on the x-axis, and good Y will be expressed on the y-axis. The model plots a budget line with a negative slope representing the relative price of good Y in terms of X. This budget line must be tangent to a bowed-out production possibilities frontier, maximizing the country's utility prior to trade. The country is then able to import and export goods along its budget line, allowing greater utility to be achieved in the free trade market. Consequently, changes in the slope of the budget line due to relative price changes can either improve or worsen a country's terms of trade. These changes may be the result of taxes and tariffs imposed by countries, influencing prices faced by producers and/or consumers.

By creating two graphs using the BTM, it is possible to analyze the manner in which two countries' production, imports, and exports of goods X and Y increase and decrease as a result of trade policy. On a third graph, the import demand and export supply curves can be plotted for dirty good X to visualize the effect that these changes have on world price and production. For this example, let the BTM represent the relationship between the European Union and China. Let China, the world's largest carbon emitting entity, function as a net exporter of dirty good X while the EU functions as a net exporter of clean good Y.[10] The EU's ETS based carbon pricing

functions as a domestic tax on producers of good X whereas the CBAM imposed on its imports functions as a tariff on imports of good X. The BTM can be used to graphically depict the implementation of both of these policies and illustrate the effect that they will subsequently have on world price and production of the dirty good. Figure 1 helps to demonstrate the carbon leakage caused by implementation of a domestic production tax (ETS). Although the domestic production of the dirty good X decreases, imports of good X increase substantially, incentivizing production of the good in other countries. Applying a tariff with the production tax, as the EU plans to do with the CBAM, negates the change in production present with the tax and instead decreases both imports and exports from the free trade scenario. This will remain true as long as the imposed tax and tariff are equal to each other as is the case with the CBAM.

The decrease in import demand resulting from this policy will negatively affect net exporters of the dirty good X as both demand and price of the good relative to good y will decrease in the world market as shown in figure 2. As a net exporter of good Y, this secondary effect of the CBAM will make the EU's exports worth relatively more and increase their terms of trade whilst imposing a negative effect on net exporters of good X like China. It can therefore be argued that the EU's CBAM does in fact violate the WTO's most-favoured-nation principle as it does not impose the same burden on all countries. Instead, the regulation targets countries that rely on exports of dirty goods, many of which happen to be significant economic powers. While it is true that implementing the CBAM will help decrease GHG emissions, it is also true that it will affect the international market in a manner that will have positive effects for the EU and negative effects for many of its competitors. Although, it could be argued that the urgency of emissions reduction justifies this type of discriminatory behavior, there may be another emissions reduction solution that is both effective and non-discriminatory.

3. *The Free Trade Alternative to the CBAM*

Instead of imposing tariffs on carbon-intensive producers, the EU could begin to negotiate free trade agreements with countries that are leaders in green production of carbon-intensive goods. For example, some of Australia's largest steel companies such as Bluescope, Fortescue Metals, and Liberty Steel have proposed plans for green steel production and to reach carbon neutrality between 2040 and 2050.[11] The country is uniquely positioned as the estimated third-cheapest country to erect a hydrogen-based steel industry due to its environmental conditions and access to higher access to solar energy.[12] Negotiating free trade agreements with Australia, a top 20 trading nation, could prove beneficial to both countries as both are committed to lowering carbon emissions and desire competitive prices. Additionally, as negotiations for a free trade agreement between the EU and Australia already began in 2018, it may prove relatively easy to reach a deal in a short period of time.[13]

Figure 3 reveals how striking a free trade agreement with Australia would increase Australia's production of good X and decrease their production of good Y. Although there is an increase in production of good X, Australia has the ability to produce the good sustainably. Due to this sustainable production, the EU is provided with incentive to increase their production tax, import more sustainably produced X and focus on producing good y, of which the EU has a comparative advantage. The application of a free trade agreement with Australia and an increased domestic production tax in the EU achieves the union's goal of decreasing GHG emissions without incentivizing carbon leakage. As can be seen in figure 5, the EU's utility does decrease slightly as a result of this policy, however this also occurs under the CBAM.

This policy should not affect China because the increase in import demand resulting from the EU's increased production tax and the increase in export supply due to the removal of

Australian tariffs will negate each other. As demonstrated by figure 4, the price of good X relative to good Y does not change, and countries with a comparative advantage in good X like China will not be negatively affected. The CBAM regulations that the EU will soon render active directly violate the WTO's MFN principle. However, the proposal outlined here does not violate any WTO principles while achieving the same emissions effect, proving superiority over the EU's CBAM.

Caveats

Although the basic trade model is a useful tool for analyzing international trade of carbon-intensive goods, it does not come without a few key limitations. The model does not internalize external pressures stemming from activists, politicians, industrial workers, and it instead relies on a few theoretical frameworks to predict policy outcomes. In reality, there are many factors that determine the import and export level of goods, and there is much more variation in carbon-intensive goods than the model has the ability to display.

Unlike the CBAM, the free trade policy solution presented in the latter half of this essay conforms with WTO principles. However, article XX of the 1994 GATT may render the CBAM's violation of WTO principles meaningless.[14] This article states that the CBAM may be justified via an environmental exception, although the validity of this claim is debatable. The European Council has stated that climate neutrality provides potential for economic growth, for new business models and markets, for new jobs and technological development.[15] It seems that even if the CBAM does violate WTO principles, the EU may not care, seeing in this trade discrimination the opportunity to reduce GHG emissions while also improving their competitiveness.

Conclusion

In fine, the European Union's recent signing of CBAM regulations violates the WTO's most-favoured-nation, discriminating against countries with a comparative advantage in carbon-intensive goods and no carbon pricing mechanisms in place. Instead of engaging in this discriminatory behavior, the EU should negotiate free trade agreements with countries investing in green production of carbon-intensive goods and increase the domestic carbon pricing that is already imposed within the EU's jurisdictions. The example given in this essay revolved around green production of steel in Australia, a country with whom the EU has already begun negotiating free trade. Unlike the CBAM, these policies would not distort world prices. The EU's increase in import demand of Australia's cleaner version of good X is mitigated by Australia's increased export demand of X, stabilizing world prices. Unfortunately, there is not a single policy solution that will decrease GHG emissions to the levels described by the IPCC. Rather, addressing climate change and preventing global warming of 2°C or more will require a myriad of policies, the proper time to implement them, and unwavering support from the entire international community.

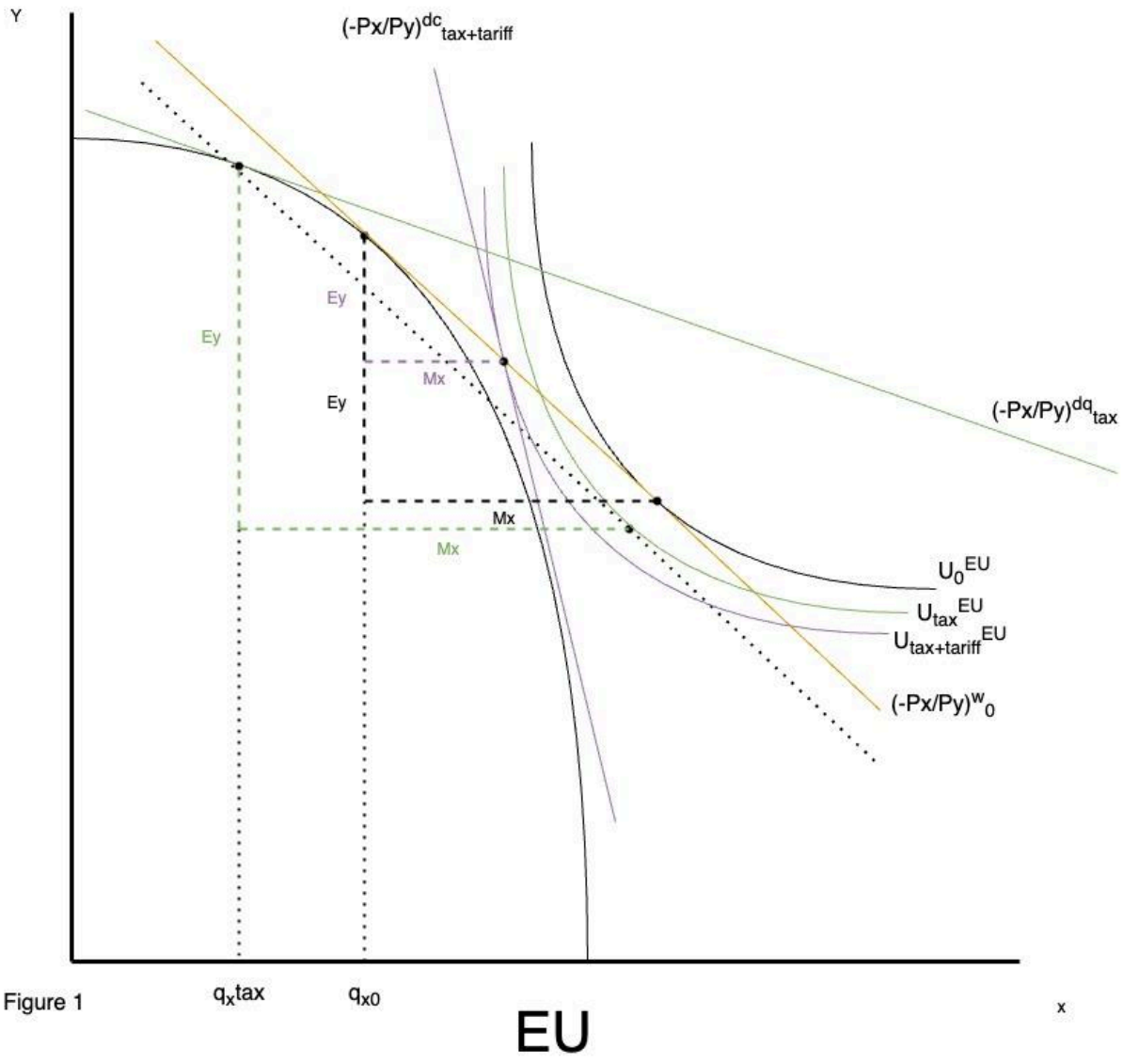

Figure 1

EU

Production Tax on X	Production Tax + Tariff (CBAM)
$Px^{dq} = (1\text{-tax})Px^{w}$	$Px^{dq} = (1\text{-tax})(1+\text{tariff})Px^{w}$
$Px^{dc} = Px^{w}$	$Px^{dc} = (1+\text{tariff})Px^{w}$
$Py^{dq} = Py^{w}$	$Py^{dq} = Py^{w}$
$Py^{dc} = Py^{w}$	$Py^{dc} = Py^{w}$
$Px^{dq}/Py^{dq} = (1\text{-tax})(Px/Py)^{w}$	$Px^{dq}/Py^{dq} = (1\text{-tax})(1+\text{tariff})(Px/Py)^{w}$
$Px^{dc}/Py^{dc} = (Px/Py)^{w}$	$Px^{dc}/Py^{dc} = (1+\text{tariff})(Px/Py)^{w}$

For any tax on producers, set the tariff s.t. $(Px^{dq}/Py^{dq}) = (1\text{-tax})(1+\text{tariff})(Px/Py)^{w} = (Px/Py)^{w}$

$(1\text{-tax})(1+\text{tariff}) = 1$
$(1+\text{tariff}) = 1/(1\text{-tax})$
$t = (1/(1\text{-tax}))\text{-}1 = \text{tax}/\ 1\text{-tax}$

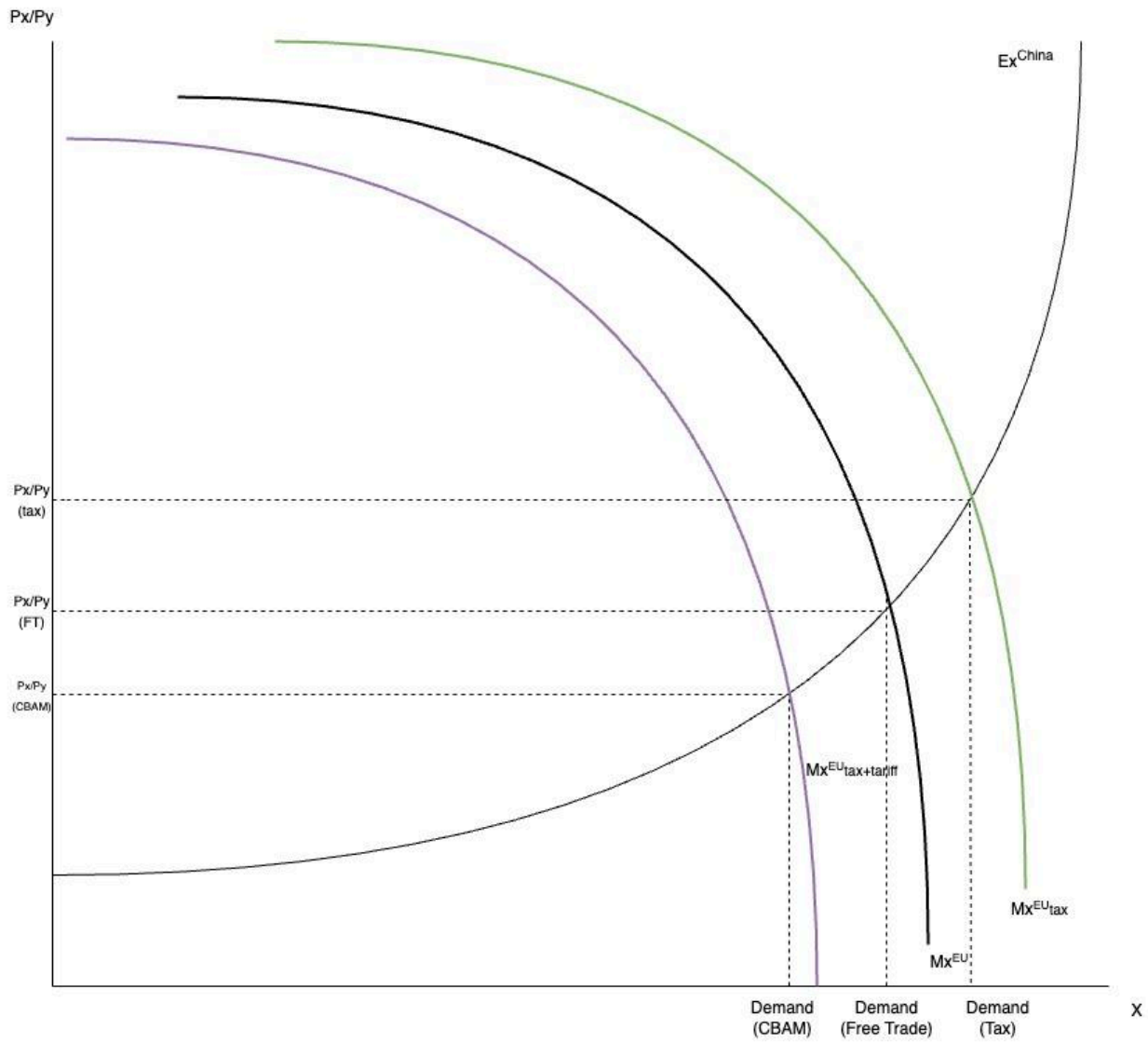
Px/Py
Ex^China
Px/Py (tax)
Px/Py (FT)
Px/Py (CBAM)
Mx^EU tax+tariff
Mx^EU tax
Mx^EU
Demand (CBAM)
Demand (Free Trade)
Demand (Tax)
X

Figure 2

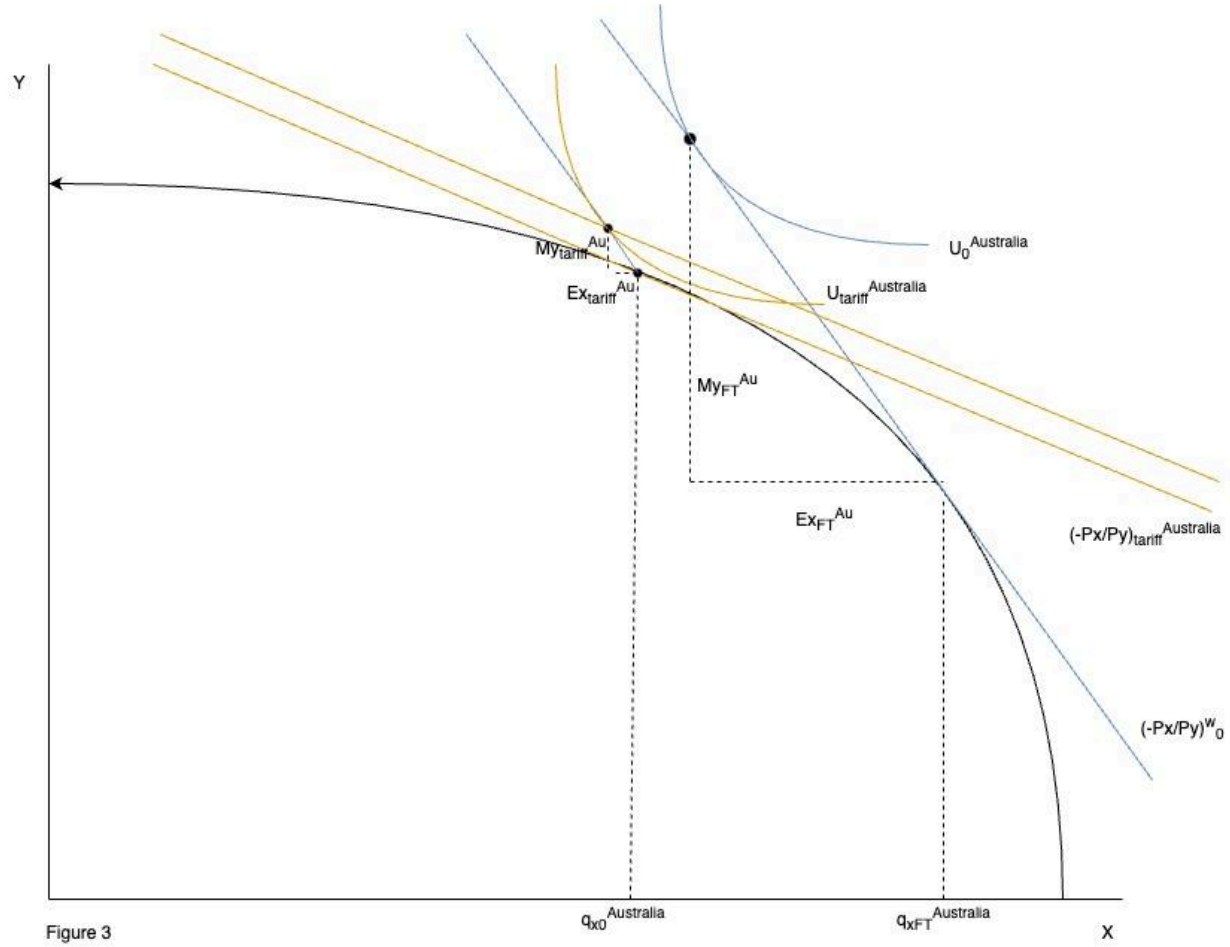

Figure 3

Australia

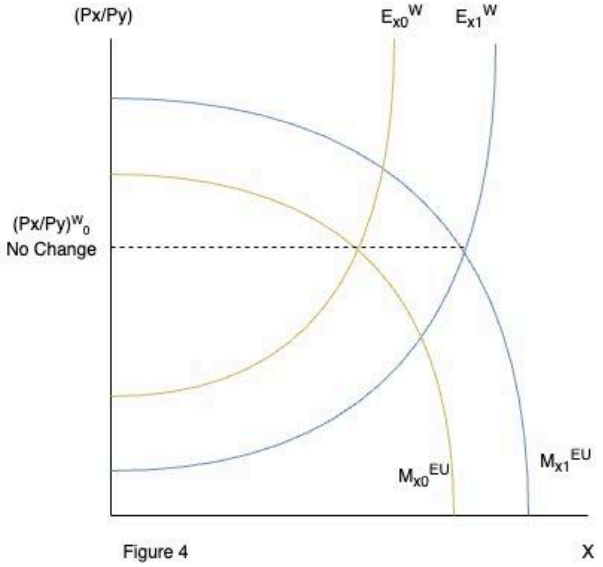

Figure 4

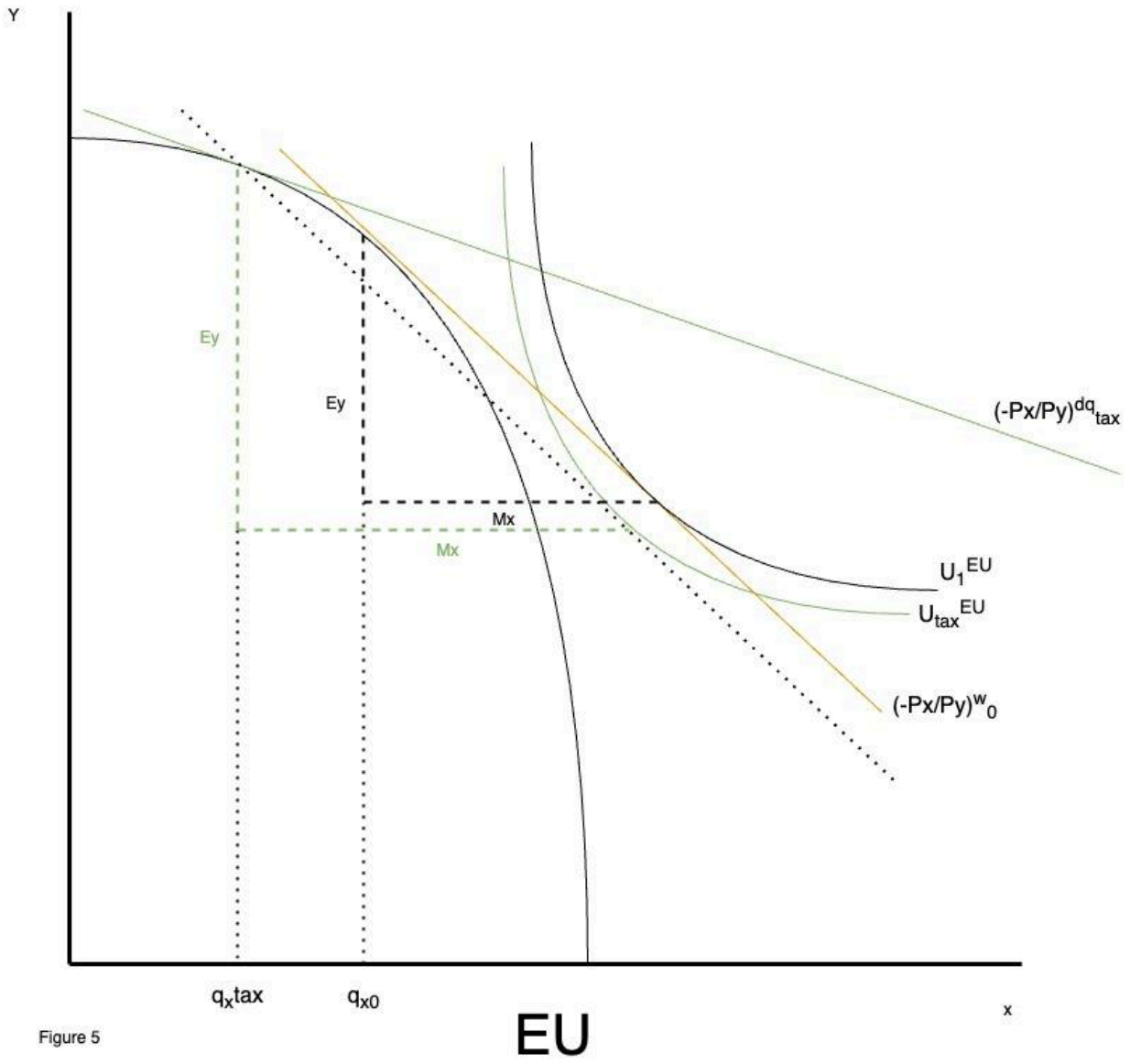

Figure 5

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