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Commodities and inflation under a border-tax regime

The House GOP proposal for a border-adjusted corporate income tax, if implemented, would lead to two segregated markets with different prices, where US prices would trade at a significant premium. It would also lead to a sharp USD appreciation, but likely less than what the academic literature predict, which in turn would put upward pressure on US inflation. In addition, switching to a border-adjusted corporate income tax without any associated measures would put the entire US retail industry at risk.



The prospect that the house GOP's "better way" tax plan could become reality is currently roiling the oil industry. The proposal aims at reducing the corporate tax level (to somewhere between 15-25%), but that is not what gets the energy sector excited. It is the potential for a border-adjusted corporate income tax which would have broad implications for the industry. Almost every Wall Street bank has published a report as well as most energy specific independent research shops. However, in our view most of these reports fail to accurately understand the mechanics of the tax shift. In addition, while this has been the hot topic in the oil industry for the past few weeks, there seems to be a complete lack of acknowledgement outside the oil industry even though the proposed change in corporate taxation would impact most goods and most industries in the United States.

In this report, we will guide through the proposed changes for the US corporate income

STEFAN WIELER
RESEARCH@GOLDMONEY.COM

tax by using the oil industry as an example. However, this tax change would affect all other industries as well. In addition, we will discuss the potential adverse ramifications for the US retail industry from the tax shift, something that so far has not been properly addressed.

We are not tax experts. In this note we look at the potential impact from a shift in the US corporate tax code purely from an arbitrage perspective. We simply analyze how - based on arbitrage considerations - companies will most likely react to a change in taxation in order to maximize profits, how that in turn impacts import and export flows and how this potentially affects prices and ultimately foreign exchange rates.

In our view, the only way to make a proper assessment of the likely impact of the tax change is to fully understand how the tax shift affects prices, production, profits and potentially exchange rates from a Pareto efficient competitive equilibrium perspective. Only once that framework is established can one begin to question whether prices will move as expected or whether there can be frictions or exceptions that lead to a deviation from the theoretical levels. Many of the reports we have read fail to establish a (or “the” as there is only right or wrong in this case) price framework based on competitive equilibrium and begin straight with qualitative arguments to justify their conclusions. Importantly, we believe that arbitrage conditions demand that prices will change in a clear and conclusive way. Any deviations from these levels would also demand that the market would be no longer in equilibrium after the tax change came into effect or it was not in equilibrium to begin with. There are indeed cases where we think that will be the case, but without understanding that there is a rule, one cannot possibly identify the exceptions to the rule. Thus, in our view, a discussion without a proper framework is futile.

Importantly, **there are two effects that change the price of US goods and the profitability of US companies: arbitrage and a macroeconomic effect on USD exchange rates. The arbitrage effect is not debatable. The macroeconomic effect on USD exchange rates is.** The price changes due to arbitrage must happen or otherwise arbitrage opportunities exist, and they will quickly be exploited. The price effect due to arbitrage will also be instant. The effect on USD exchange rates, however, is based on macroeconomic theory. It requires exchange rates to move in line with predicted shifts in US trade flows. But that is theory and there is a host of things we can think of that would lead to a completely different outcome. The academic literature assumes that the only thing affecting USD exchange rates is how imports and exports change. But exchange rates are also driven by interest rates (which according to current academic literature is simply assumed not to be affected) and plain simply by supply and demand for dollars. In the end, exchange rates will be what the market says they are.

They can deviate from theoretical values for decades. Even if the macroeconomic effect on USD exchange rates would play out exactly as predicted by theory, it will most likely take years to get there.

It seems that there is only one consensus conclusion almost all analysts can agree on. **The introduction of the tax would create two market prices for oil and petroleum products: A US domestic price and an international price, where the US price will be above the international price.** This price differential is necessary due to arbitrage mechanics and not economic theory.

However, this is where the consensus ends. In our view, most reports are riddled with misconceptions, which we will rebut in this report:

- The price differential can be exactly calculated, it does not require any assumptions;
- A 20% border-adjusted income tax will lead to a 25% price differential, not 20% (it is more complex than that; what actually changes is the price ratio will move by 25%);
- Current corporate profits are irrelevant in regards to how much prices will change;
- It is irrelevant whether the good in question is traded globally in USD (like most commodities) or in other (local) currencies;
- It is irrelevant whether the US is a net exporter or importer of the good in question. Even if a good produced in the US has no domestic market, the same principles hold. The same holds true for goods that are 100% imported;
- Oil is just a good like any other, all arbitrage principles apply in the same way;
- Refineries that are mainly importing crude oil will not automatically be at a disadvantage and refineries that are exporting products will not automatically benefit;
- Prices for US consumers only increase if one of the theoretical assumptions does not hold (Which is that the USD appreciates by 25%. We believe that this assumption will not hold, but it's important to understand that there is a condition in the first place, which most reports fail to identify).

We will go through our calculations and present our findings in detail below.

In a nutshell, we find that the introduction of a border-adjusted income tax would lead to a two-price market. US prices would trade above international prices. The ratio of the two prices would increase by about 25%. As an exception to the rule, the ratio of retail goods might increase by less than 25%, especially for expensive retail goods (oil and oil products will most likely be unaffected by this).

Further, we expect a sharp appreciation of the USD, but the appreciation will most likely fall short of the theoretical 25% increase as suggested by most academic literature. **This will lead to a sharp rise in US price inflation. Importantly, because gold prices in the US would see the same price increase as commodities, savings in gold will offset this inflation shock**

And last but not least, this tax might have vast implications for US retailers if no counter-measures are taken. This aspect of the tax so far has not been properly explained and addressed.

Initially, the market had largely ignored the tax proposal for most of 2016, even after President Trump won the US election in November. But starting late December last year, the oil market began to aggressively price in an increased likelihood for the proposal to become law. But comments by President Trump shortly before his inauguration have put a damper on expectations and the oil market has reversed sharply (but not fully). However, this morning president Trump said at a meeting with business leaders that “we are going to be imposing a very major border tax” on the product that comes in. Whether that really refers to a border-adjusted cooperate income tax or simply to potential tariffs (which president Trump has preferred in the past), needs to be seen.

The proposed change in corporate tax code

Under current law, US corporations are taxed on their profits at a marginal rate of 35 percent, one of the highest in the world. In reality, the average tax rate at which US companies are taxed is lower. One of the proposals from the incoming administration and the house republicans is to reduce the corporate tax rate to 15-25% (we use 20% throughout the report). Importantly, the current US tax code does not differentiate where the income has been generated as long as foreign income is repatriated. Hence, US producers will be indifferent between exporting and selling domestically if the price of their goods is the same in both markets. This in turn demands for prices for goods to be the same domestically and abroad once transportation costs are taken into account. If that is not the case – for example the price of a good is higher in the export market than in the US, US producers would try to export all their goods. This would lead to a shortage of goods domestically and domestic prices would have to rise until that gap is closed. Similarly, US retailers are indifferent between buying their goods from a US producer and importing them if all-in costs are the same. In either case, both producers and retailers will be taxed on their net income.

Under the proposed tax change, US companies would no longer have to pay tax on any revenues from exported goods. In turn, costs of goods sold could no longer be expensed if the goods are imported. For example, a US car manufacturer exporting a car for USD20,000 would not have to tax these revenues yet the costs to manufacture the car would still be accounted for. Conversely, a retailer that imports sneakers from China would have to pay tax on the full revenue of the retail price of the sneaker as he could no longer expense the purchase costs of the sneakers against it.

For the US oil industry, this means the following: US crude oil producers would not pay tax on the revenues of oil they export. Refiners importing crude oil would not be able to deduct the costs for the imported crude oil from their taxes. If they export product, they would also not be taxed on the revenues. And a merchant importing product would not be able to deduct the costs of the imported product from taxes, but would also not be taxed on products he exports.

At first sight, this tax proposal might look like a tariff, which would go against WTO rules. It appears so because it specifically taxes imports and excludes exports. However, a tariff discriminates imports against domestic production. The proposed tax is designed to act more like a value added tax (VAT) without really being one. Thus, the tax applies to both domestic and imported goods in the same way. We will explain that in more detail with examples later in this report.

The WTO stance on border-adjusted taxes is that border-adjusted indirect taxes (VAT) are allowed while border-adjusted direct taxes (such as income taxes) are not. Border-adjusted VAT is WTO sanctioned and already used by many countries. The argument of the proponents of a US border-adjusted corporate income tax is that the effects would be similar to a VAT as it targets consumption.

Impact of border-adjusted corporate income tax on oil industry

We are going through the potential impact on the US oil industry step by step and look at it from the perspective of different players (producers, refiners, merchants). We will first introduce a simple framework with no US domestic transportation costs by choosing Houston as the US price point for both the producer, the refiner and the merchant. In a second step, we account for domestic transportation costs. This will increase complexity and can have an impact on how price ratios change with the tax.

A shift to a border-adjusted corporate income tax is best understood in steps. With the current corporate tax rules, US companies are indifferent between selling their products domestically and exporting (producers) as well as buying crude oil domestically or importing (refiners). The market is in equilibrium. With a border-adjusted tax, that changes. In the **first step**, the tax affects the net after-tax profit of the different entities. Producers can generate a higher after-tax profit by exporting. Hence producers will have an incentive to export all their crude oil. Thus, in a **second step** refiners will have to compensate domestic producers by paying a higher price. This will lead to a two price market. It will also lead to a sharp increase in after-tax profits for US producers. This leads to the **third step**. US producers of all goods have now a competitive advantage and, thus, will aggressively increase output. They can gain market share both domestically and internationally by undercutting existing prices. This will lead to a shift in net US imports, which in turn will increase demand for USD, as the USD rises, after-tax profitability declines again. In a perfectly offsetting scenario, the USD would increase exactly enough to bring the entire market back to the initial equilibrium (we will discuss later why this last step suggested in current academic literature is most likely incorrect).

Producers

Assume a US producer in Texas who can deliver crude oil to Houston refineries or to the Houston export port. For simplicity, we assume there are no transportation costs to either (we simply look at the decision the producer is facing once he shipped the oil to Houston. Don't worry, we do the same thing with transportation costs later). The table below shows how a border-adjusted tax affects his decision making. For simplicity, we start with a corporate tax rate of 20% rather than the current 35%, so we isolate the impact of a shift to a border-adjustment.

Figure 1: Impact of border-adjusted tax on US oil producer

Producer		Selling domestically				Exporting			
		A Current tax system	B Border-adjusted tax (BAT)	C BAT with price change	D After USD appreciation +25%	E Current tax system	F Border-adjusted tax (BAT)	G BAT with price change	H After USD appreciation +25%
Production costs	40	40	40	40	40	40	40	40	40
Price Houston	50	50	50	63					
Price international	50				50	50	50	40	40
Taxable income		10	10	23	10	-40	-40	-40	-40
Tax (20%)		2	2	5	2	2	-8	-8	-8
After tax income		8	8	18	8	8	18	18	8

Source: Goldmoney Research

At the beginning, the US producer is indifferent between exporting and selling domestically, both leaves him with an after-tax profit of USD8 (columns A&E).

A border-adjusted tax changes that. Selling domestically still leaves him USD8 profit, but exporting makes him USD18, because he does not have to tax the revenues. He still has USD40 production costs, so he ends up with a taxable loss of -USD40 (worth USD8), which he can either use against revenues from other domestic sales or he can carry it forward (indefinitely) to expense against future revenues. In this situation, he will export all of his crude oil to maximize profits (columns B&F).

In order to buy crude oil from a US producer, a US refinery will, thus, have to offer a higher price. The price will have to go up by 25% to make the producer indifferent between exporting and selling domestically. We explain later why at this price the refiner will also be indifferent between importing and buying domestically. Please note that at this point, the tax has led to a two-price market. Oil in the US is traded at USD63, internationally still at USD50 (columns C&G).

The third step is the currency appreciation. Because US producers are much more profitable than before, they will increase output and start undercutting international prices. This does not just affect the oil industry but the entire US manufacturing sector. Because all US manufacturers can maximize their profits by gaining market share, overall US imports will sharply decline and exports sharply increase, which in the end, leads to the theoretical 25% appreciation of the USD. This would offset the competitive advantage of US producers and bring imports and exports back to the initial equilibrium. It also brings US prices and after-tax profits of US producers back to pre-tax change levels (Columns D&H). The international price declines to USD40 (-20%) but in foreign currency it would still be the same as before the tax as all currencies declined by 20% vs. the USD.

Importantly, the price ratio of US domestic to international prices will have increased by 25% in the end. It becomes clear from this example that this is due to arbitrage and does not require any macroeconomic assumptions such as the potential impact on USD exchange rates. More specifically, whether the price changes from USD50/USD50 = 1 to USD63/USD50 = 1.25 or back to USD50/USD40 = 1.25 yields the same result: With or without the USD appreciation, the ratio changes by 25%. This is also true when the initial price ratio is lower or higher than 1 (we will show this later in the more complex analysis with transportation costs)). Please note that only with a 25% USD appreciation, the after-tax profit of the producer will be back to where it was before the tax shift. Hence, if the USD appreciation falls short of the theoretical 25%, it creates a windfall profit for all US producers and it will lead to consumer price inflation.

Refiners

Take a refinery in Houston. The refiner can either buy crude oil domestically or he can import crude oil. We assume he sells domestically only, but the same principles that we explained for the US crude oil producers also apply to the US refiner when faced with the decision to sell petroleum products domestically or to export.

Figure 2: Impact of border-adjusted tax on US refiner

Refinery in Houston		Buying/selling domestically				Importing and selling domestically			
		A Current tax system	B Border-adjusted tax (BAT)	C BAT with price change	D After USD appreciation +25%	E Current tax system	F Border-adjusted tax (BAT)	G BAT with price change	H After USD appreciation +25%
Price at Houston	50	50	50	63	50	50	50	40	
Price international	50				50	50	50	40	
Manufacturing cost	15	15	15	15	15	15	15	15	
Sales price	72	72	72	86	72	72	86	72	
Taxable income		7	7	9	7	7	57	57	
Tax (20%)		1	1	2	1	1	11	11	
After tax income		6	6	7	6	6	-4	6	

Source: Goldmoney Research

At the beginning, the refiner is indifferent between buying crude oil domestically and importing (Columns A&E). He sells his product (gasoline) for USD72 and makes an after-tax profit of USD6.

With a border-adjusted income tax, his profit remains USD6 when buying domestically but drops to -USD4 when importing crude oil, because he can no longer deduct the costs of the crude oil from taxes (Columns B&F). Hence, the refiner will try to buy 100% of the crude oil from a domestic producer

However, as we remember, the US crude oil producer doesn't want to sell any crude oil domestically as he makes a much higher profit exporting. Hence, the refiner will have to bid up the price of domestic crude oil so that the US producer is indifferent again. That price is - as we showed in the producer calculation - USD63. In order to be profitable again, the US refiner has to increase the price for his product as well. And he is indifferent between importing crude oil and buying domestically at a gasoline price of USD86 (+25%) and we will show later why that is also the price where a merchant is indifferent between importing gasoline or buying it from a US refiner. (Columns C&G).

The last step again is the currency appreciation, which again, is not because of the US gasoline market alone but the impact of the tax on the overall US imports and exports. With a 25% USD appreciation, the US refiner would again make an after-tax profit of USD6.

Merchant

Last but not least, let's consider the viewpoint of a US merchant. A merchant could trade any number of petroleum products, including crude oil itself. The merchant's decision-making process is basically a combination of the producer and the refiner.

Figure 3: Impact of border-adjusted tax on US Merchant

Merchant in /Houston		Buying/selling domestically				Buying domestically and exporting			
		Current tax system	Border-adjusted tax (BAT)	BAT with price change	After USD appreciation +25%	Current tax system	Border-adjusted tax (BAT)	BAT with price change	After USD appreciation +25%
Price Houston Refinery	72	72	72	86	72	72	86	72	
Overhead costs	1	1	1	1	1	1	1	1	
Sales price domestic	74	74	74	93	74	74	74	59	
Sales price international	74								
Taxable income		1.00	1.00	5.10	1.00	1.00	-73.00	-87.40	
Tax (20%)		0.20	0.20	1.02	0.20	0.20	-14.60	-17.48	
After tax income		0.80	0.80	4.08	0.80	0.80	15.60	4.08	

Source: Goldmoney Research

The merchant buys gasoline from a US refiner and resells it. Initially, he is indifferent between exporting and selling domestically

With the tax shift, the merchant has an incentive to export as his after-tax profit greatly increases. Thus, he would buy as much gasoline as he can and export it all.

However, the refiner will increase the price for gasoline in order to react to the tax shift. With the higher gasoline price, the merchant becomes indifferent between exporting and selling domestically but his after-tax profit is a lot higher than before the tax shift.

With the USD appreciation, his after-tax profit (in USD) declines to previous levels.

The same principles apply if the merchant is selling domestically and faces the decision to either import or buy from US refiners. However, analyzing the merchant's decision-making process highlights some important conclusions:

1. It is irrelevant whether a certain type of crude or product has to be exported (meaning there is no market for it in the US). There still has to be a US domestic price (where the merchant offers to buy) and the ratio of that price/foreign price has to increase by 25%. If it is below that, a merchant would buy all available product and export it. This would in turn force the price up to the required ratio.
2. Once the market has completely rebalanced, the merchant makes the same after-tax profit when exporting or selling domestically. However, when exporting, he is cash flow negative (he has a tax credit which he can use against future domestic revenues). In practice, the merchant might therefore lean towards selling domestically, even if that would push the domestic sales price down (and the ratio would actually then change by less than 25%). However, over the long run the merchants would, thus, operate sub-optimally. A company with plenty of domestic revenue, like an operator of gas stations for example, could, therefore, acquire the merchant, switch from selling domestically to exporting and increase after-tax profits. Or the company with lots of domestic revenue simply starts competing with the merchant. Hence, the proposed tax shift is likely to also lead to a boom in M&A in the industry. But importantly, the negative cash flow effect would in our view not sustainably affect the 25% increase in the price ratio that is demanded by the arbitrage mechanism.

Adding transportations costs to the equation

Things become a bit more complex when transportation costs are taken into account. In a nutshell, we find that transportation costs generally have no impact on how the ratio of US prices to international prices changes. For example, if a specialty product has a price of USD100 in Houston and USD110 in Shanghai, then the price ratio before the tax change is 1.1 and the transportation cost is USD10. With the new tax, that price ratio increases by 25% to 1.375. The exact prices in Houston and Shanghai are dependent on the USD appreciation, but the ratio will be 1.375 in any case.

Figure 4: Impact of border-adjusted tax on US producers with transportation costs

Producer		Selling domestically				Exporting			
		Current tax system	Border-adjusted tax (BAT)	BAT with price change	After USD appreciation +25%	Current tax system	Border-adjusted tax (BAT)	BAT with price change	After USD appreciation +25%
Production costs	40	40	40	40	40	40	40	40	
Wellhead price	45	45	45	56	45	45	56	45	
Price Houston	50	50	50	63	50	50	63	50	
Price China	60				60	60	60	48	
Transportation to Houston	5	5	5	6	5	5	6	5	
Transportation from Houston to China	10				10	10	10	8	
Taxable income		5	5	16	5	-45	-46	-45	
Tax (20%)		1	1	3	1	1	-9	-9	
After tax income		4	4	13	4	4	13	4	

Change of price ratio					
	Current tax system	BAT with price change	Change	After USD appreciation +25%	Change
Houston/China	0.83	1.04	25%	1.04	25%
Wellhead/China	0.75	0.94	25%	0.94	25%

Source: Goldman Research

The table shows that the ratio between the price in **Houston and the price in China** always changes by 25%. Note that the transportation costs from Houston to China are expected to decline by 20% if the USD appreciates by 20%. This is because tankers are rented internationally (international prices decline by 20% in USD) and wages paid in non-USD decline by 20% in USD terms. Also, the fuel oil that is used to power the tanker is 20% cheaper in USD because it is de-facto exported fuel oil, which trades at a 20% discount to US domestic fuel oil.

The ratio between **wellhead prices and China** also increase by 25%. If the USD appreciates by the full 25% then costs for everything stay the same. If the USD appreciates by less than 25%, then US domestic transportation costs increase. Why is

that? If the USD does not appreciate, then US prices have to go up in order to be 25% above international prices, otherwise arbitrage opportunities arise. Hence, the US would see an instant 25% inflation. This becomes very intuitive for rail transportation costs for example. As the cost of US oil goes up from USD50/bbl to USD63/bbl and costs for diesel move accordingly, the costs to run the diesel power trains also go up by 25%. Hence, the price ratio of oil in Houston and oil in China goes up by 25% with the tax in any case.

The same can be analyzed from the perspective of a US refiner again

Figure 5: Impact of border-adjusted tax on US refiners with transportation costs

Refinery in Houston		Buying/selling domestically				Importing and selling domestically			
		Current tax system	Border-adjusted tax (BAT)	BAT with price change	After USD appreciation +25%	Current tax system	Border-adjusted tax (BAT)	BAT with price change	After USD appreciation +25%
Wellhead price	45	45	45	56	45				
Price at Houston	50	50	50	63	50				
Price in Canada	30					30	30	30	24
Transportation from Wellhead to Houston	5	5	5	6	5				
Transportation from Canada to border	5					5	5	5	4
Transportation from border to Houston	15					15	15	19	15
Manufacturing cost	15	15	15	19	15	15	15	19	15
Sales price	75	75	75	94	75	75	75	94	75
Taxable income		10	10	13	10	10	45	56	45
Tax (20%)		2	2	3	2	2	9	11	9
After tax income		8	8	10	8	8	1	10	8

Change of price ratio					
	Current tax system	BAT with price change	Change	After USD appreciation +25%	Change
Houston/Canada	1.67	2.08	25%	2.08	25%
Wellhead/Canada	1.50	1.88	25%	1.88	25%

Source: Goldmoney Research

The same principles apply here. Price ratios of US domestic to international prices change by 25%. Again, transportation costs from the Canadian border to Houston are expected to go up by 25% should the USD not appreciate. In addition, US manufacturing costs would also go up by 25% in this scenario. In the end, all price ratio move by 25%, whether the USD appreciates or not.

We forgo a detailed analysis of the merchant point of view because all the principles above apply there as well.

How is the USD exchange rate affected?

As we have explained above, the ratio between the cost of the good in the US and the international cost is given by the corporate tax rate and is fixed due to the arbitrage relationship. However, while the ratio between the international and the domestic price is given by arbitrage, the realized USD appreciation will most likely differ from the theoretical move.

Academic literature assumes that US trade flows will change exactly in line with corporate profits. The introduction of a border-adjustment to corporate income tax would give a competitive advantage to US producers as exports are quasi subsidized. The theory is that this will increase US exports and decrease US imports, leading to an increased demand for USD which in turn would increase the USD exchange rate. If the whole market is to rebalance perfectly, the USD would have to appreciate by exactly 25%. After the currency appreciation, US trade flows, US domestic prices and US after-tax profits would be back to where they started (in USD). International prices would be 20% lower in USD but also back to the previous levels in local currency. However, it is very unlikely that the USD appreciates by exactly 25%.

First, the rebalancing mechanics above assume that US producers have costs in USD and foreign producers have costs in foreign currency exclusively. This is obviously not the case. Many foreign producers, for example, are exposed to costs in USD. An oil producer in Nigeria, for instance, might have a contract with a drilling service provider that is set in USD. Overall, costs for commodity producers are about 70% in USD. Hence, when the USD increases, the costs for the foreign producers increases relatively to his domestic currency. The profitability of the foreign oil producer, therefore, would decline and he becomes less competitive vs. US producers and foreign producers with no USD-linked costs. This will push foreign marginal producers out of business. It is very unlikely that US commodity producers could step in with increased production right away in order to meet global demand (we will explain that in the next paragraph). Hence, the USD appreciation has to be less than 25% in order for foreign marginal producers to survive, or the price of the commodity has to go up in local currencies (and in turn also in USD in the US).

Second, the above also assumes that US producers have a competitive advantage and will undercut international prices to gain market share if their profitability increases. But that is unlikely for all industries. Take the US copper industry for example. If the profitability of US copper producers increases due to the change in tax regime, they will not try to gain market share internationally because they are somewhat limited in how much they can increase production, not just over the short run, but even long-

term. US copper producers are largely price takers. If profitability increases they will simply enjoy a windfall profit. It would probably take decades to ramp up US copper production to a level where it starts impacting the global copper price.

This means that the initial decline in US imports and increase in US exports on the back of the tax might not be as much as theoretically assumed. This, in turn, would imply that the USD might not appreciate as much as theoretically expected in order to rebalance the market. Hence, while we would expect the USD to increase sharply if a border-adjusted tax is introduced, the actual increase will most probably fall short of the theoretical 25%. As a side effect, that will help US producers in industries which can ramp up to gain market share.

Importantly, over a long enough timeframe, the two counter-arguments above would not hold. Over time, even US copper producers would be able to ramp up output if the competitive advantage of 25% persists. But more importantly, USD linked costs of foreign producers would come off over time as well (by 20%). A drilling contract set in USD, for example, would at some point expire. If the drilling service provider is not willing to re-negotiate the USD price down (by 20%) then the producer would use another driller that prices in a different currency. The drilling service provider's profitability on the other hand would not be impacted if the prices for his service decline by 20% in USD. Why? If the drilling service provider is a non-US company, then their costs have gone down by 20% anyway, as they pay wages and other expenses in local currency. And if the drilling service provider is a US company, then the company can offer a 20% discount, because the revenues are no longer taxed (they are not provided in the US, thus, de facto exported). Hence, the examples above would lead to a very long lag in the appreciation of the USD rather than no appreciation at all.

However, USD exchange rates move on a myriad of other things than just trade balances. For example, exchange rates are also driven by interest rates (which academic literature simply assumes will not be affected by the tax shift) and simply by supply and demand for dollars. In the end, exchange rates are what the market says they are. They can deviate from theoretical values for decades, otherwise there would be no carry trades. Even if the tax shift led to a change in trade flows exactly as predicted by theory, and USD exchange rates moved exactly in line, also as predicted, this rebalancing would take years if not decades, and during that time the USD would not fully appreciate by 25%. By the time the market is supposed to have completely rebalanced, exchange rates would have moved by much more than 25% for completely different reasons.

What does the tax shift mean for inflation?

As the arbitrage mechanism requires US prices to be 25% above international prices, if the USD appreciates by less than 25%, US domestic prices would have to increase by the difference. Therefore, the tax could lead to a sharp one-off rise in price inflation in the US. Not just of petroleum products, but basically all products sold in the US. This in turn, could have a negative impact on demand and economic growth. And the result could be a further change of the rebalancing of imports and exports. The overall price increase would mean that the US consumer would have to pick up the tab. The beneficiaries would be the US producers, which would see windfall profits and an increase in market share. How much inflation the tax creates depends, therefore, on how much USD appreciation we see. We have seen a whole host of estimates on how much inflation is to be expected. However, all these calculations disregard that US prices have to be 25% higher due to arbitrage mechanics. Non-US producers will not lower their prices in their domestic currencies in order to react to a change in US tax laws. Hence, if the USD does not appreciate, the only way US prices trade 25% over international prices is by US prices going up.

What about the assertion that some refiners might benefit while others get hurt?

We have read in several reports that some refiners - east coast, west coast and heavy oil refiners - would supposedly be at a disadvantage to USGC refiners and refineries that consume mostly US light sweet crude or export most of their products. While we believe that some refiners might be impacted differently than others, it's not for the reasons stated in the reports.

As we have shown above, as long as the USD appreciates by the full 25%, after-tax profits remain unaffected by the tax change, regardless whether the refinery imports crude or buys domestically. However, if the USD appreciates by less than 25%, it does matter. Refineries generally will end up with higher after-tax profits. But the refinery that imports crude will not necessarily have lower after-tax profits than the one using domestic crude (see Figure 5). In fact, refiners that have locked in transportation costs for some period would benefit. Usually, rail transportation costs are among the highest. Hence, an east coast refiner having locked in the costs for importing Canadian crude by rail might actually benefit more than a refinery in Texas using domestic crude. This goes against the results presented by most other research reports we have read. In those reports, the analysts simply assumed that importing crude = bad because not tax deductible and exporting product = good because not taxed. But this shows a gross lack

of understanding of how the arbitrage mechanism will impact price differentials in the US and globally.

What about crude or product that is trapped or regions that must import?

Regions that must import crude or product will not be at a disadvantage in any case. Crude differentials globally will realign so that they will not be worse off than before. As we highlighted in the previous paragraph, those refiners with fixed transportation costs might even benefit if the tax led to a sharp increase in inflation. However, the situation is a bit different for crude and product which is trapped in the US: The one exception to the rule is that if the USD appreciates by less than 25%, US crude producers will be at a competitive advantage. Exporting crude would be quasi subsidized by the US consumer paying higher prices. This – one can argue – will lead to higher future US output, all else equal, which, in turn, could mean that US exports hit the wall sooner than otherwise expected. Once US export capacity is fully exhausted, US crude prices in some locations could dislocate again, shaving off the premium to international crude and even trade at large discounts, something we have witnessed in the past. However, we believe that the planned tax shift would contribute very little to such a scenario. With absolutely no USD appreciation, US crude prices would move from currently USD52/bbl to USD65/bbl on the back of the tax shift. Oil prices have moved far more than that over the past 3 years, from over USD100/bbl down to under USD30/bbl and back up again. Hence, should an increase of US production on the back of higher prices lead to an exhaustion of US export capacity, then the tax will in all likelihood have contributed very little to that. In other words, it would have happened anyway.

What are the exceptions?

Prices of US crude or product could deviate from arbitrage implied levels for several reasons. First, some prices might be linked through a contract. For example, a refinery might have entered an agreement whereby it buys Canadian crude oil delivered to a US destination (the refinery location) at a premium to prices at Edmonton. The party that supplies the crude, therefore, takes care of the shipment either via pipeline or rail and assumes this price risk. But with the tax shift, the full burden of the price differential would fall on the supplying party. The agreed price would reflect the Canadian oil that is discounted by 20% to US crude. Importantly however, should the refiner decide to resell the crude into the local market rather than consuming it, he

would only do so for the US domestic price at this location.

Outside the oil industry there are a number of examples where US and international prices don't move as predicted. Any good or service that can't be exported at all obviously doesn't have a US domestic and an international price to begin with. Real estate for example can't be exported (or imported for that matter). Though, US real estate might still be affected by changes in USD exchange rates (stronger USD might deter foreign investors) and inflation. If prices for construction material and energy goes up, costs for new buildings increase which in turn affects existing real estate as well. There is a number of other goods that simply can't be exported because they are specifically made for the US market, hence there can't be two prices. The same goes for some services. A company providing US tax advisory will not be able to simply "export" their services even if that would mean not paying any tax on the revenues because the shipment costs are too high relative to the value of the item to make it far. Thus these goods are produced and sold locally. The price is simply a function of local supply and demand. These goods might still be affected by an increase in overall inflation, but there is no arbitrage mechanism that demands prices to move in a certain way at the time when the tax is implemented.

All the exceptions listed above aren't really exceptions because none of these goods or services have an export price to begin with: They are not exported. But because these goods and services exist, the impact of the tax shift on inflation (should the USD not appreciate) would be somewhat muted, or at least lagged.

The unintended consequences for US retailers

The impact of a border-adjusted corporate income tax on US retailers does not seem to be widely discussed. We have found only one report that raised the subject, but without much discussion or detail. However, in our view, there are vast potential ramifications.

The main issue is that the proposed tax shift applies to corporate taxes only. It is correct that for a company doing business in the US, the price differentials between domestic prices and foreign prices must hold. US domestic prices will always have to be 25% above the import price, or the buyer is not indifferent between importing and buying domestically. However, that is true ONLY when the buyer is a company. A private person that consumes the good rather than reselling it, cannot offset the costs of the good from his taxable income. Hence, a consumer is not indifferent between importing and buying domestically when the domestic price is 25% higher.

Figure 6: Impact of border-adjusted tax on the US retail sector

	With 25% USD appreciation			Without 25% USD appreciation		
	US Retailer Importing	Foreign retailer exporting	US retailer trying to compete	Retailer Importing	Foreign retailer exporting	US retailer trying to compete
Foreign wholesale price	8,000	8,000	8,000	10,000	10,000	10,000
Foreign retail price		9,270			11,713	
Import duty (5.5%)	440	510	440	550	644	550
Overhead costs	400	320	400	400	400	400
Import (export) costs	100	100	100	100	100	100
Domestic retail price	12,000		9,880	15,000		12,457
Taxable income	11,500	950	9,380	14,500	1,313	11,957
Tax (20%)	2,300	190	1,876	2,900	263	2,391
After tax income	760	760	-936	1,050	1,050	-985
Price paid by US consumer	12,000	9,880	9,880	15,000	12,457	12,457

Source: Goldmoney Research

Take an expensive watch or a piece of jewelry, for example. A US retailer for watches and jewelry is currently taxed on his net income. Assume he buys watches in Switzerland for CHF10000 and assume the exchange rate USD/CHF is 1:1, so his cost per watch is USD10000. Import duties are 5.5% and the retailer has overhead costs of USD500 per watch. He then sells the watch in retail in the US for USD12000 and makes a pre-tax profit of USD950. With a corporate tax rate of 20% he is left with a net profit of USD760.

With a border-adjusted corporate income tax, the USD exchange rates would theoretically drop to 0.8:1. Hence, he only pays USD8000 for the watch. But he is taxed at 20% on USD11500 as he can no longer deduct the costs of goods sold (he can still deduct the overhead costs). His tax is USD2300 and his net profit is still USD760.

The problem is that his customer can also import the watch. For example, he can simply order it online in Switzerland directly from a Swiss retailer. The Swiss retailer still sells for CHF11500 (he buys it for CHF10000 from the watch manufacturer and has CHF500 overhead costs), but in USD that is now only USD9200. On that, he pays USD506 import duty. For the customer, it doesn't matter whether he imports or buys domestically from an income tax perspective, he will not be able to deduct the costs from his income taxes as he does not resell the watch or use the watch as an input good in his production. Hence, he is much better off importing the watch himself. The US retailer, in that case, would not be able to compete with that price.

In the above example, we went with the 25% currency appreciation suggested in academic literature. But the outcome is the same if the USD does not appreciate. In

that case, the problem becomes even more obvious. The US retailer still pays USD10000 for the watch. Because he cannot deduct the costs from his revenues for taxes, he has to increase the price of the watch in retail to USD14640 in order to generate the same after-tax profit of USD760. This is well above the retail price of USD12000 in Switzerland (plus import duty of USD660), and, thus, a consumer is much better off importing himself.

If there is no offsetting mechanism, it would become very difficult for US retailers to compete with foreign retailers in our view. The higher the value of the goods the more likely US consumers are to buy from a foreign online retailer.

Would an exemption of the border-adjustment for certain goods help? Suspending both the taxation of imports and non-taxation of exports would just mean to pass the buck from the retailers to the producers. Producers would suffer from lower export prices due to the USD appreciation but they would now have to pay taxes on exports again. At the same time, importing retailers could offset their COGS again, which would drive domestic prices towards international prices. This would be a disaster for domestic producers. Also, a partial exemption – for example allowing certain imported goods to be offset as COGS while still not taxing export revenues – would not solve the problem. In that case, domestic prices would still converge down to international prices. Producers would only want to export, leaving retailers only with imports. The only way a US retailer could sell US produced goods at a competitive price would be if the US producer exported the good first, and then the retailer re-imported it. In addition to this inefficient way of selling domestically produced goods, a partial exemption would have another consequence. While it would have a somewhat neutral impact on corporate profits, it would lead to a significant loss in tax revenues.

Another way would be to simply exempt a certain industry (e.g. retail) instead of certain goods. In practice, that would mean to allow retailers to offset the costs of imported goods. But that, in turn, would mean that retailers could only sell imported goods as domestic prices would be too high, which does not seem to be a desirable outcome either. This would also lead to substantial loss in tax revenues, as producers of consumer goods would, in turn, have to export everything and, thus, not pay any taxes on the revenues.

It is unclear to us how this would be solved. One way to prevent this, could be a 25% tariff on all imports which importers could claim back if they are a corporate entity. This would level the playing field for retailers, as import prices for natural persons would converge to those paid by retailers. However, given the WTO's stance on tariffs, it seems unlikely that the US could simply put a 25% tariff on all retail goods. In

addition, if the USD appreciation turns out to be less than 25%, there would be a one-off US consumer price inflation equal to the difference.

If there isn't any measure alongside this proposed tax shift that relieves the retail sector from this problem, the industry would probably find a way around it. One potential way we can think of is if retailers were switching to a brokerage model. Instead of warehousing goods and selling them, retailers - at least those selling high value items - would become de-facto brokers: Instead of importing goods themselves, they act as agents for foreign companies exporting their products to the US. A US retailer would provide storage services to the foreign entities and help them facilitate the trade, for a fee. But ultimately, it would be the foreign entity that sells the product. Hence, the US retailer would simply be taxed on the income from the fees. The foreign entity would be taxed on the sales revenue, but not in the US, and, thus, the foreign entity could deduct the costs of the product from corporate income taxes. Alternatively, a US retailer could simply establish non-US entity abroad and export the goods to the US itself. Either way, this would allow the US retailer to be competitive with the US consumers, but it would also lead to huge inefficiencies. On top of that, US retailers would also not be able to sell US produced goods at a competitive price, unless they had been exported first and then reimported. Also, shifting to a brokerage model might not work within the US tax framework. The IRS might have an issue with US retailers not having any revenues and more so with foreign corporations de-facto acting like they were US retailers but not paying any US corporate income tax. We leave it to tax experts to come to a conclusion.

It is certainly not in the interest of those proposing this tax shift to damage the US retail industry and force US producers to export all their product, if just for having it reimported later. We are not lawyers and there might already be a mechanism in place that could be used to prevent this of which are unaware. But if not addressed, the tax shift could have huge unintended consequences.

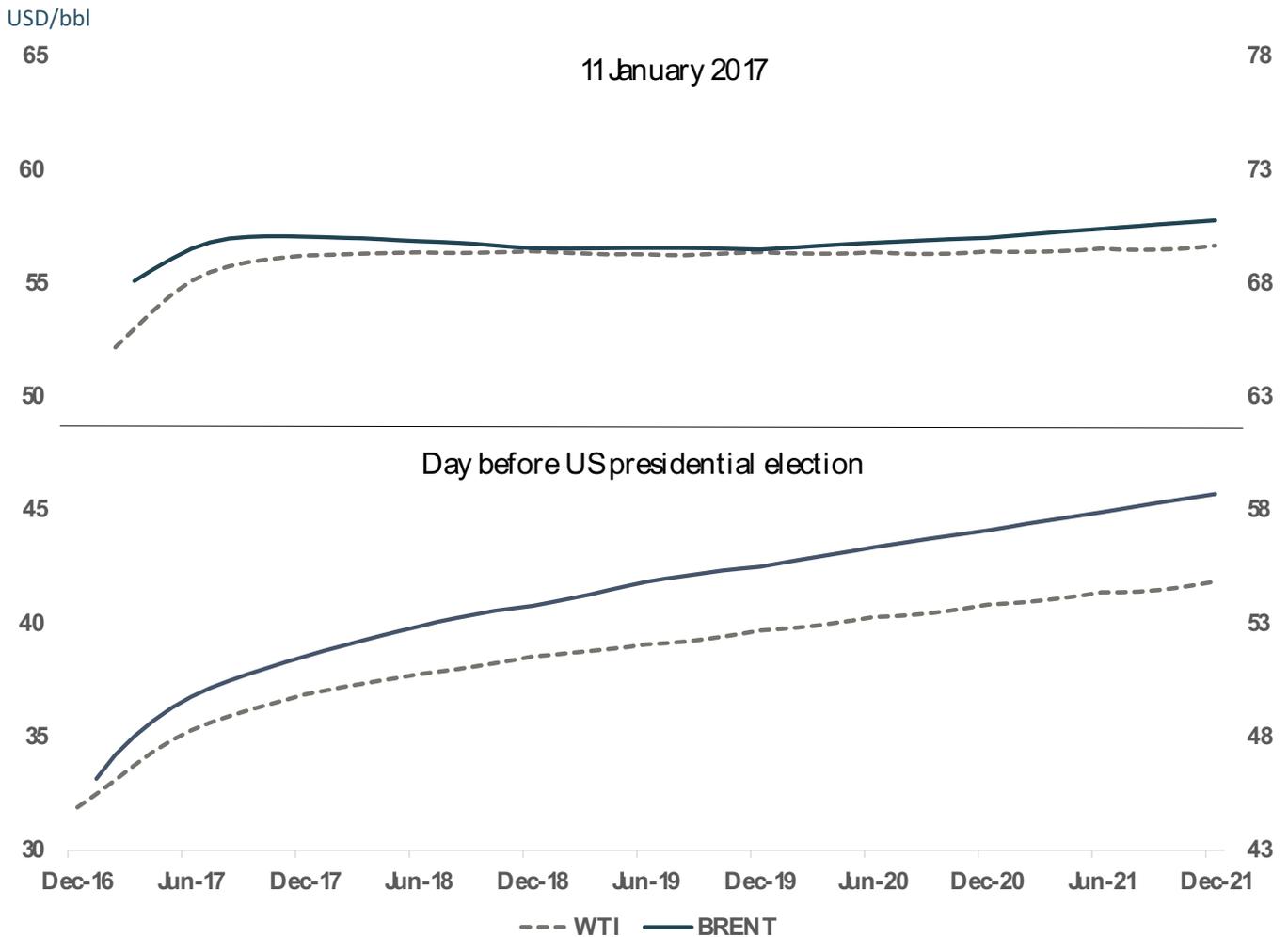
The likelihood of a border-adjusted tax

We have seen estimates ranging from around 30% likelihood to about 70% likelihood that this tax change will become reality. The likelihood has certainly increased when President Trump won the election mid-November, but the market has only caught on this over the past weeks. There are some obvious trades on the back of this tax shift. Most goods are priced in their local currencies, but some are traded in USD globally: commodities. West Texas Intermediate (WTI) and Brent crude have very similar

characteristics and are usually regarded as very close substitutes. For decades, WTI had usually traded slightly above Brent as Brent was imported into the US. The difference in the price reflected transportation costs. This changed when US shale oil led to an overabundance of light sweet crude in the US market. With the US abandoning the ban on us crude exports, WTI can now be exported and sold internationally. As a result, WTI has traded about USD2/bbl below Brent for the past few years, also reflecting transportation costs (mostly pipeline costs from Cushing, OK, where WTI is priced, to the USGC).

Given that those two grades are excellent substitutes, the introduction of the border-adjusted income tax should move the ratio between WTI and Brent by the predicted 25%. However, the price differentials did not reflect any increased likelihood of a border-adjusted corporate income tax after the “better way” proposal was presented. In fact, forward differentials moved the other way. Even after President Trump won the Election, prices did not react. By late December, the WTI forward curve was still on average about USD2/bbl below that of Brent. But starting late December last year, the market began to aggressively price in an increased likelihood of the border-adjusted income tax becoming reality. The forward curves of Brent and WTI traded almost at parity. However, a few days before his inauguration, then president elect Trump publicly criticized the border-adjustment aspect of the “better way” proposal as too complicated (compared to import tariffs). This led to a sharp reversal of the previous gains in the WTI/Brent differentials. However, since then, president Trump has made several comments that seem to contradict his rather negative stance on a border-adjusted corporate income tax. Most notably today, (Monday 23 January, 2017) when he said at a morning meeting with business leaders that “we are going to be imposing a very major border tax” on the product that comes in. Whether that really refers to a border-adjusted cooperate income tax or simply to potential tariffs (which president Trump has preferred in the past), is not clear.

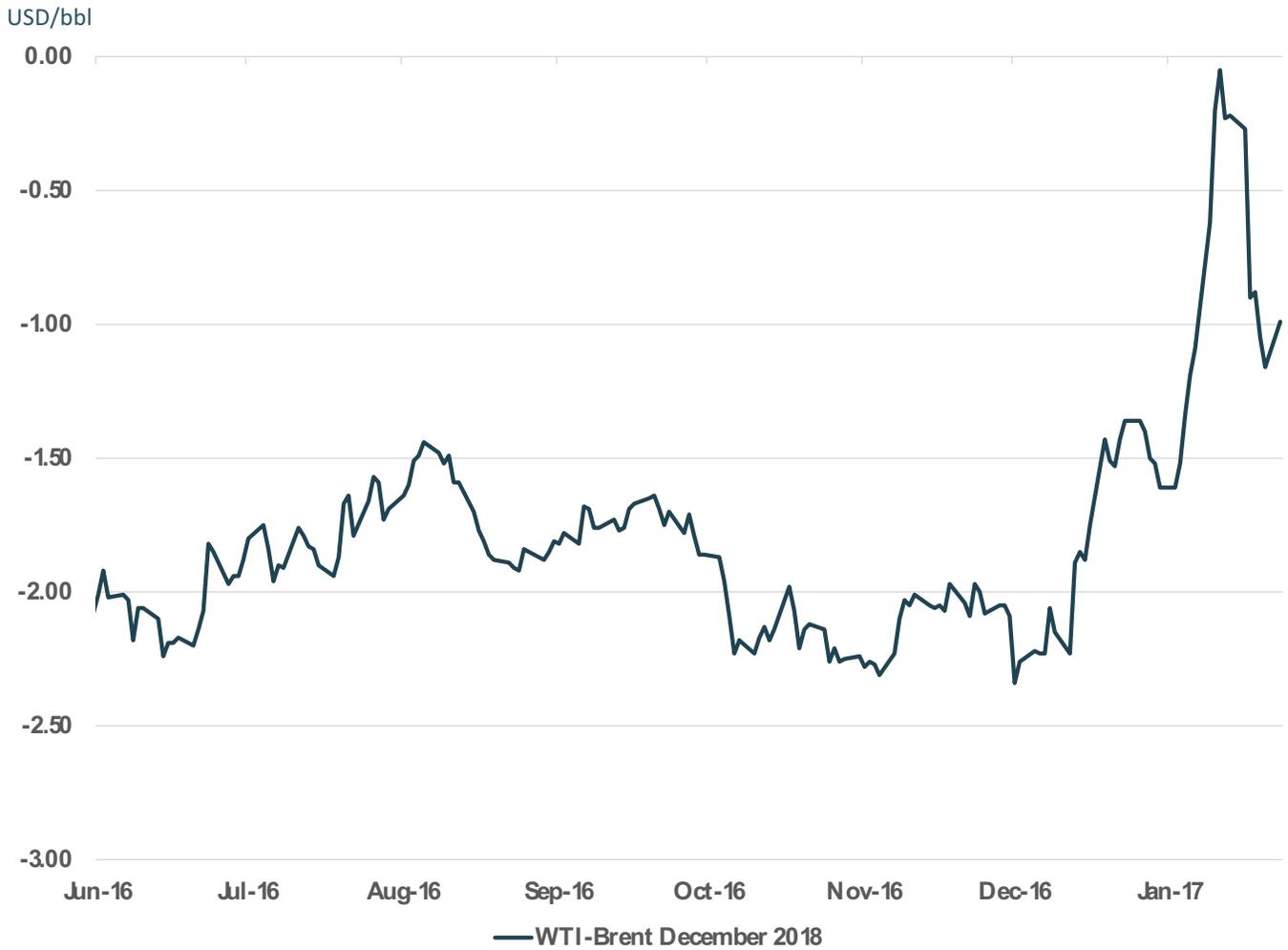
Figure 7: Oil market starts pricing in higher likelihood that the border-adjusted tax proposal becomes law



Source: Bloomberg, Goldmoney Research

At the time of writing, December 2018 WTI futures are trading roughly USD1/bbl below Brent. This means that the market has given back about half of the late December rally. The ratio would have a lot more to move if the tax actually becomes reality. All else equal, WTI would trade USD8-11 over Brent with the tax (depending whether Brent prices decline as the USD appreciates or WTI rise as the USD remains unchanged). On net, prices have only moved about USD1 as of now, which suggests that the oil market currently prices in a roughly a 10% chance of the tax proposal becoming law.

Figure 8: President Trump's comment that a border-adjusted tax would be too complicated led to a sharp reversal of the WTI/Brent forward spread.



Source: Bloomberg, Goldmoney Research