

The Tragedy of the Asses:

Stock Liquidation and Inverted Lemon Markets mould Medicinal “Bottom Up” Deglobalisation

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Abstract

The paper traces China's extraordinary U-shaped demand for donkeys and the related emergence of a donkey skin global supply chain that prices a donkey hide at rates higher than the annual per capita income in donkey-dependent parts of rural low-income country environments. Three economics frameworks are drawn from to explain contested resulting donkey depletion and welfare dynamics: Clark (1973) and Dercon (1996) on poverty-driven livestock asset liquidation; an inversion of Akerlof's (1970) "Market for Lemons," in which unobservable hide provenance produces a pooled price that subsidises illicit sourcing and externalises depletion costs; and Kremer and Morcom (2000) on how the storability of hides and *ejiao*, combined with inconsistent regulation, risk accelerating rather than arresting donkey stock depletion. Together these dynamics constitute a "tragedy of the asses" — compound depletion mechanisms the cost of which fall both on donkey stocks and disproportionately on the world's poorest women and girls. The cumulative result is an historically unprecedented response: the African Union's 2024 fifteen-year continent-wide moratorium on donkey slaughter — a very rare but perhaps foreboding act of bottom-up deglobalisation and African trade unity. Failure of the moratorium risks accelerating these dynamics, and success may generate its own political economy consequence. This forms a unique contribution to the modern high-income country-anchored de-globalisation literature, helps to correct for the absence of study of the donkey in economics, and also sets out suggestions for the directions for future research.

I Introduction

From roughly 1990 to 2008 the world economy was characterised by a period of extraordinary economic expansion that built upon complex cross-border production and services networks, and producing what Baldwin (2016) called the “Great Convergence”. The intellectual foundations of the era include Krugman (1991) on how trade liberalisation together with scale economies and falling transport costs induce agglomeration benefits while concentrating production and deepening specialisation across borders; and Grossman and Helpman (1991) on how comparative advantage evolves endogenously across countries as globalisation deepens.

Export-led growth in the era’s persistent surplus economies ultimately relied on debt-financed consumption in the US and other Anglo countries as a demand engine, helping to induce the Global Financial Crisis of 2008 (Bernanke, 2005; Palley, 2011). Prior, however, an array of fears that “globalisation had gone too far” (Rodrik, 1997) had been expressed. Rodrik’s (1997) concern was that deep integration was eroding policy space and ultimately concentrating adjustment costs on the least mobile workers and producing a political backlash that may produce an unstable political economy dynamic. In *Globalization and Its Discontents* Stiglitz (2002) more directly argued that the institutional mismanagement of globalisation was producing political fragility. Making the case that criticisms of globalisation overstated the costs, in *In Defense of Globalization* Bhagwati (2004) highlighted globalisation’s global development gains, and suggested issues should be addressed by better-governed integration and not less globalisation.

More recently Goodhart and Pradhan (2020) have highlighted that adverse demographic shifts emerging since around 2008 have increasingly helped to end what was a paradigm built on rising inequality within countries being offset by rising general economic well-being. Further to their argument, the heights of globalisation were underwritten by two complementary and parallel demographic dividends: the peak consumption years of the baby boomer generation in high-income Western economies and Japan that generated the import appetite to support an export-led Lewisian model of development in some emerging markets, notably China (Johnston, 2019). Arguably China’s one-time low-wage-based industrial transformation not only enabled literal blue sky economic thinking in the West, but elevated high-income country revenue margins while simultaneously suppressing inflation (Goodhart and Pradhan, 2020). Chinese economist Cai Fang noted that the end of this growth model in China itself equates

with the end of the country's "Pareto-improving reforms" era. That is, the end of the era of reform without losers (Cai, 2018).

The aftermath of such a massive — and complementary — high-low demographic dividend growth symphony, within and between countries, is an era characterised by lower household income growth, trade wars, political "shocks" and populism, and weaponisation of globalisation's defining supply chain interdependence (Farell and Newman, 2019; Johnston, 2020). Underpinning these dynamics is the accumulated legacy of globalisation-era import competition from China having generated concentrated and persistent unemployment in selective US labour markets, with losses disproportionately borne by manufacturing workers without college education: blue-collar males (Autor, Dorn and Hanson, 2013). Wage stagnation in import-competing industries, regional scarring in deindustrialising communities have also been highlighted (Hakobyan and McLaren, 2016; Caliendo et al., 2019; Colantone and Stanig, 2018). Deaton (2020) linked falling wages, weaker labour market prospects, and social cohesion loss among less-educated white Americans with increasing "deaths of despair" — those by suicide, drug overdoses, and alcohol-related disease (Case and Deaton, 2020). Goodhart and Pradhan's (2020) pessimism may prove optimistic if research highlighting China's long-run economic demography transition growth model proves foresightful, and out of which China ultimately offers another "shock" but in this case further up the value-chain (Johnston, 2018 and 2021).

Far from high-income country political economy rivalries, some developing countries have begun to wonder if they face a new China-linked economic challenge. There is some evidence, for example, that China's industrial upgrading and rising labour costs are not automatically redistributing low-wage manufacturing to lower-income developing economies in the way that happened under later 20th century globalisation, and that simple factor-cost logic predicts (Autor et al., 2021; Khandelwal et al., 2023). This suggests both that globalisation-era economic assumptions may have had a high-income country analytical bias, and that global development in future may (need to) be different from the past. Meanwhile, some 70 percent and 60 percent of total employment in sub-Saharan Africa and South Asia respectively remain in the informal sector (ILO, 2018) and this implies there is less confidence that global value chains will ever reach these workers.

The market for donkeys is also mainly informal, unglamorous, data-sparse and relatively absent from the economics literature. Roughly 40 million working donkeys support transport,

agriculture, and small-scale trade across Sub-Saharan Africa, South Asia, the Middle East, and Latin America — regions home to much of Collier's (2007) "Bottom Billion" (Starkey and Starkey, 2004; Burden, 2013). Their role is ancient: as a trade and production technology, the donkey not only re-shaped human societies but its capacity to traverse steep mountain passes opened the Chinese end of the original Silk Road. Arguably this places the working donkey at the very origins of what is now the China trade shock literature (Autor et al., 2013; 2016; Caliendo et al., 2019).

An update of the donkey's economic roles is, moreover, also warranted by a full globalisation circle that owes to the rise of *ejiao* (pronounced e-jyao), a little-known Traditional Chinese Medicine compound with donkey hide collagen as its active ingredient. Not only has skyrocketing demand for *ejiao* produced a donkey shortage in China but has also produced a global hunt for the skin of the slow-breeding donkey that some fear risks the donkey's existence itself. Those fears owe to a rare composite of accelerating depletion mechanisms across the entire donkey hide supply chain, which we call a 'tragedy of the asses'. The same composite, however, in 2024, produced a remarkable and little-known act of de-globalisation from below: a rare fifteen-year African Union (AU) continent-wide moratorium on trade-related donkey slaughter. The donkey's domestication dates to around 3000 BCE and in northeast Africa, most likely in the Nile Valley region of present-day Egypt and Sudan (Rossel et al, 2008), making the AU's decision something of a historic globalisation full circle also.

This article studies the market for donkeys and its recent de-globalisation shock. Section II offers a consolidated overview of the donkey's economic contribution; Section III traces China's extraordinary U-shaped demand for donkeys; Section IV studies the emergence of a little known China trade shock – recent and rapid globalisation of *ejiao* industry donkey-related supply chains; Section V sets out the consequences in Africa of the newly globalised value chains that were elaborated in Section IV; Section VI documents a rare intra-Global South act of deglobalisation – an Africa-instigated fifteen donkey-trade moratorium – as well as China's response; Section VII reflects a unique case of bottom-up globalisation and the contemporary political economy of the donkey hide market, and Section VIII concludes and offers research suggestions.

II The Hitherto Invisible Ass of the Market

For most of recorded human history and throughout most agrarian economies, the substitution of animal labour for human labour power was the main driver of agricultural productivity growth. *Equus africanus asinus*, the donkey, is arguably the original factor augmenting technology – and a role that both predates mechanisation by several millennia and which remains in some remote, hard to reach, and low-income contexts. Where the donkey features in development studies, veterinary science, and animal welfare journals, however, the animal is quite remarkably all but invisible in standard agricultural economics, trade economics, and labour economics.

II.I The Donkey as the Original Productivity and Trade Shock

The donkey's domestication falls between that of cattle and the horse, making it one of the earliest large animals to be brought under human control for productive purposes (Beja-Pereira et al., 2004). Archaeologists and historians find evidence that the donkey's domestication and contribution to ploughing, irrigation and milling multiplied human agricultural output productivity and so relaxed then land-labour ratio constraint. The donkey's load capacity, speed, feed requirements, and disease resistance relative to the horse shaped the cost curve of overland trade and the viability margin of early interregional exchange (Starkey, 2000). The early “donkey shock” empowered specialization and trade between nearby communities (Clutton-Brock, 1992).

In the ancient Near East and Mediterranean the donkey is understood to have provided the labour to move Bronze Age urban civilisation material foundations and for emerging long-distance trading networks (Clutton-Brock, 1992; Postgate, 1992). As the domesticated donkey spread eastward from Africa, together with the camel it became a pillar of ancient logistics. Where camels served as the desert supertankers of the Silk Road, while donkeys and mules — the sterile progeny of donkeys and horses — dominated shorter, steeper, and more challenging routes requiring animal calm and foot stability (Clutton-Brock, 1992; Bang, 2008). Mules were especially valuable on rugged terrain, and together with donkeys functioned as the container ships and haulage trucks of ancient trade. The donkey's unique capacity to traverse the formidable mountain ranges of Central Asia unlocked the Chinese

end of the original Silk Road and enabled westward carriage of Chinese metals, spices, agricultural produce, and textiles across otherwise impassable terrain.

II.II The Industrial Revolution and the Marginalisation of the Donkey

The Industrial Revolution (IR), as Mokry elucidates in *The Enlightened Economy* (2009), was a set of economic and cultural conditions that lowered the cost of innovation and fostered its dispersion. Some early mechanisation inventions, particularly those transforming cotton manufacture, such as ‘spinning jennies’ and ‘spinning mules’, were named after the donkey, whose labour they replaced (see also Acemoglu and Johnson, 2024). Diffusion of steam power, internal combustion engines, and mechanised farm equipment, were among innovations that would progressively displace animal traction over the nineteenth and twentieth centuries in early industrialisers, reducing donkey and horse populations dramatically and confining animal labour to far more niche or recreational uses. The working equine population of the United Kingdom peaked at approximately 3.3 million in 1900 and had fallen to under 100,000 by 1970 as tractors and motor vehicles displaced animal traction across agriculture and transport (Thompson, 1976). In the United States and Australia, the donkey’s earlier economic retrenchment led to the emergence of large wild donkey populations that persist.

A transition from use of the working donkey in low- and middle-income countries emerged later, and in many such countries the donkey retains an essential working role. The world’s estimated 40-50 million working donkeys are mainly working in Sub-Saharan Africa, South Asia, and parts of Latin America and the Middle East. Typically, this work takes place in conditions, typically rural, remote, dry and in sparsely populated areas, where mechanised alternatives are not in place, and hence where the donkey remains an essential household capital good (FAO, 2018; Burden, 2013; Geiger et al, 2021).

The working donkey carries a particular load for women and girls. For example, in Sub-Saharan households without direct access to water it is near unexceptionally women and girls who carry responsibility for water collection — a task involving heavy loads, long distances, and cumulative adverse health impacts. Access to a donkey alleviates this drudgery directly, as well as reduces time poverty and so freeing up women's labour market participation (Folbre, 2001; Blackden and Wodon, 2006). For girls, those hours freed and resulting income generation translate into schooling, and so intergenerational social mobility (Ravichandran,

2023). Ownership of a donkey, that is, can shift the trajectory not just of a household but of an entire community.

The availability and affordability of donkeys hence functions as something of an inadvertent welfare indicator for some of the most economically marginalised populations in lower-income countries (Starkey, 2000; Starkey and Starkey, 2004). This also helps explain why donkey markets remain among the most informal of all asset markets: transactions are typically oral, prices go unrecorded, and regulatory oversight is effectively absent — placing them below even the informal economy as conventionally measured (Starkey and Starkey, 2004). Moreover, that donkey populations are relatively sparsely distributed in relatively remote areas where population surveys are rare and costly imposes barriers to empirical study. This set of circumstances also makes it challenging to quantify the economic impact of the donkey and its loss.

III China's Outlier U-Shaped Donkey Demand

The donkey became established in China around the 1st century BCE. From the sixteenth until the mid-twentieth centuries in northern wheat-growing regions especially the donkey was a prolific workhorse, against the oxen which dominated southern rice-growing regions (Shahar, 2017). Rapid industrialisation and rising per capita incomes in the late twentieth century have seen the working donkey all but disappear (Norris, Little, Ryding and Raw, 2021; Goodrum, Theuri, Mutua and Carder, 2022). Beyond its traditional working role and a more localised niche as a source of protein, after its arrival in China, however, the donkey acquired two distinctive additional and unique functions: as a polo mount for elite elder Tang Dynasty women (618–907 CE); and as a skin-collagen input for *ejiao*. *Ejiao* is a traditional Chinese medicine that is understood to offer “blood-nourishing, anti-anaemic, lung-protective, anti-ageing, anti-fatigue, antioxidant, immune-modulating, anti-tumour, anti-osteoporotic, anti-Alzheimer, oestrogen-mimicking, and skin-repairing effects.” (Wang, Chen and Chin, 2025). It's association with women's health and fertility are most famously associated with Qing-dynasty concubine Cixi having been able to bear future Emperor Tongzhi.

For thousands of years *ejiao* production was extremely limited in scale, including since it took place in small family workshops localised to a point on the Yellow River, at Dong'e, Shandong Province, the location of its current geographic marker (Köhle and Clancey, 2011). Second, its manufacture was labour-intensive drudgery and practical only in cooler months. Third, its market: *ejiao* was only available to the Imperial family and a small surrounding circle of elites. After the founding of the People's Republic of China in 1949, two forces of the late 20th and early 21st centuries, however, transformed *ejiao* from rare imperial elixir into a mass-market medicinal and wellness product. The first was the industrialisation of production and producer market concentration into a near duopoly. The second was that one of those two large firms, Dong'e Ejiao, led a highly sophisticated premiumisation strategy that boosted demand among China's emerging middle class and raised profits, and achieving something comparable to De Beers with diamonds (see Spar, 2006).

First, mid-last century ancient *ejiao* workshops were consolidated by reforms led by the Chinese Communist Party and ultimately producing today's near duopoly structure. While still centred in the ancient production heartland in Dong'e, Shandong Province, state-owned Dong'e Ejiao sits closer to Beijing on the north side of the Yellow River, in Dong'e County, Liaocheng Prefecture, while Fupiao Ejiao, which of the two has deeper direct ties to the Imperial circle, sits on the Yellow River south bank, in Dong'e Town, Pingyin County. In something of a paradox Dong'e Ejiao's products dominate the lucrative premium-end market, while Fupiao Ejiao makes larger quantities of less premium *ejiao*. Together the two *ejiao* giants lead a newly year-round industrialised production of — much larger than in the past — quantities of *ejiao*. Moreover, product innovation led by these firms, Dong'e Ejiao especially, means *ejiao* is now also consumed in a new array of forms, including pastes, tablets, tonics, and wellness blends. Moreover, today medicinal *ejiao* is covered by standard population-wide health insurance policies, further facilitating demand.

On the DeBeers-like branding and premiumisation strategy, Chinese media offers data points on recent pricing trends of an *ejiao* mainstay product. Specifically, a block of Dong'e Ejiao *ejiao* costing RMB80/kg in 2001 by March 2019 had a retail price of RMB 5,996, up nearly 75 times (Hou, 2019). Former Dong'e Ejiao CEO, Qiu Yufeng, compared ancient and contemporary *ejiao* pricing as follows: "In the Ming Dynasty, the catalog of commercial history contained detailed records of the commercial circulation of donkey-hide gelatin. At that time, the tax on each catty of donkey-hide gelatin was 1.6 qian of silver. According to tax

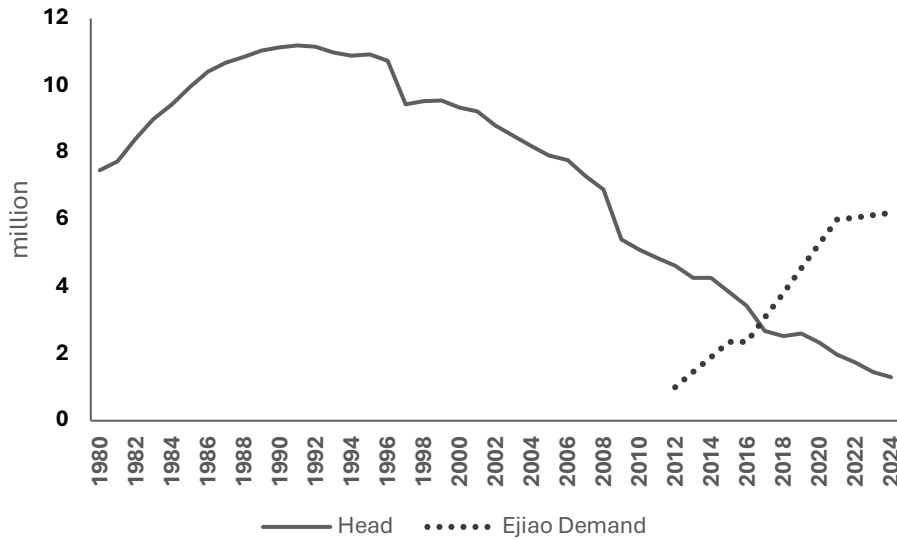
practice then the circulation tax accounted for 1/20 of the sales revenue. It is estimated that the price of *ejiao* was approximately 3.2 liang of silver per catty, which is equivalent to RMB4,000 to 6,000 per catty today (Hou, 2019(Hou, 2019). This approach transformed Dong'e Ejiao, and its operating revenue increased from RMB1.686bn in 2008 to RMB7.338bn by 2018, while its net profit was up from RMB296mn to RMB2.09bn (ibid).

Another telling example relates to the widely reported successful bid of a then-record US\$2.11 million at an eBay annual charity auction in 2008 by Chinese fund manager Zhao Danyang for the benefit of dining with Warren Buffett. What is much less known outside of China is that when that lunch took place, in New York in 2009, Zhao was photographed gifting Buffet two distinctly Chinese gifts: Maotai baijiu, the premium Chinese spirit drink and a box of Dong'e Ejiao *ejiao*. A once rare, elite, priceless and ceremonially- and in-winter-only produced item of ancient Chinese apothecary was, by 2023, part of an industry with market size of approximately 60 billion Renminbi (roughly US\$8 billion) (Guan, 2023).

The timing of the ascent of a modern *ejiao* industry was fortunate and secondarily consequential. Dong'e Ejiao, which dominates the premium market, was for example fortunate that an intensive Chinese anti-corruption campaign that began in the 2010s saw gift-giving-related demand for luxury gifts, including alcohol or designer accessories fall – but luxury gift giving demand for its premium wellness-linked *ejiao* products skyrocket. Equivalently, the early 20th century backdrop of population ageing, relaxation of family planning controls, and rising household incomes, also fostered *ejiao* demand.

On the other hand, the industrialisation process that so transformed *ejiao* production had rendered the donkey obsolete as a working animal in China. Just as the United Kingdom's donkey population had peaked in 1900 with its industrialisation, China's donkey population peaked at 11.2 million head in the early 1990s before declining to under 1.5 million — a roughly 90 percent fall. Today however, *ejiao* production requires approximately 5 to 6 million hides annually. The *ejiao* industry first reported donkey-hide supply constraints in 2010 (Bennet and Pfuderer, 2019). Sudden ejiao-linked sky-rocketing donkey demand ultimately hence produced a striking, exceptional and consequential U-shaped demand curve (Figure 1).

Figure 1: Donkey Supply and Ejiao-linked Demand (head), China



Data draw from the dataset of the United Nations Food and Agricultural Organisation (FAO), FAOSTAT, in which the donkey is classified as ‘ass’. Data feeding into this dataset relies on national and cross-regional donkey surveys that are in general not well-resourced or regular. Moreover, some countries, including Australia, the USA and some of the Sahel, are also home to wild ass populations. Since these animals are not livestock, they are not counted in the FAOSTAT data. These points speak to the inadequacy of data on of donkey stocks across time and countries.

The chronic donkey-hide shortages in China from around 2012 that are visible in Figure 1, underpinned a dramatic and little-known story of price inflation, and ultimately an intra-Global South asset market and deglobalisation shock. Where in the year 2000 the donkey hide price in China was around 20 RMB, by 2013 it had risen to around 600 RMB per hide, and by 2016 the price reached 2,500 RMB, some USD370 (Zuo, 2023). That is, a single donkey hide in China that year sold for more than the per capita annual income in much of rural Africa. *Dong’e Ejiao* stated explicitly that donkey hide supply was the company’s main growth constraint (Zuo, 2023). At that time, total *ejiao* output was around 5,000 tons annually, and related donkey hide demand was some 4-5 million hides (Sheikh and Lohre, 2023). A donkey hide weighs 8-12 kg and can produce 2.6-3.5 kg of donkey-hide gelatin (Hou, 2019). *Ejiao* products, however, are

sold with a variety of active *ejiao* ingredient intensity, meaning industry revenue is not linearly proportional to production or sales quantities.

II.II Donkey Industry Policies Fail to Deliver Much, Like Donkeys

Unlike cattle, sheep, pigs and horses, that modern agriculture has actively transformed through targeted breeding and veterinary science, and just as it has been neglected by economists, the donkey has been almost entirely bypassed by modern animal husbandry science. Its working role among the poor and extremely niche role as a source of protein excluded it from entering a commercial livestock industry value chain. This both owes to and itself fosters continuation of the species' notoriously slow reproductive cycle: a female donkey, a jenny, typically begins breeding at two to three years, gestates for approximately twelve-thirteen months, nurtures a single foal for four to six months, and overall produces no more than one foal every other year across a limited reproductive lifetime (Bennett and Pfuderer, 2020).

The *ejiao* industry has invested heavily in perhaps the world's frontier donkey breeding program, with modest results so far. Donkey numbers in Shandong province recovered from 40,000–50,000 in 2010 to roughly 150,000 head by 2020 - a fraction of Shandong's 1.5 million donkey herd of the early 1990s (Seyiti and Kelimu, 2021). The same sensitivity that led to the donkey's metamorphic integration with human civilisation has contributed to the challenge of fostering the species to breed on an industrial scale (Kinoti, 2022). The economics of would-be more traditional donkey farming in China are also unfavourable. Traditional donkey farms in China are not of industrial scale and are concentrated in China's less populous western and northern regions. Beyond the challenge of the donkey's slow breeding cycle, the cost of raising a donkey in China is comparable to that of raising a cow — but a donkey sells for less and is subject to more price volatility (Nongcun Niu Liao Sannong, 2022). Net returns from donkey rearing in 2022 were reported to be just three to five yuan per day — a figure regarded as unviable (ibid). One factor is the reported high supply chain profit-share retained by the *ejiao* industry itself. The low-cost of sourcing donkeys from abroad, Africa especially, furthermore, provided a window to circumvent this set of local breeding conditions.

As donkey hide supplies tightened, Liaocheng prefecture officials, Shandong Province, home of Dong'e Ejiao, released the "Implementation Opinions on the Development of the Million Meat Donkey Industry (2015–2019)", which proposed state-backed loans and public subsidies

of 100,000 to 300,000 renminbi for donkey farmers (Du, 2019). The goal was to build Dong'e county's herd to one million and sustain annual breeding of 400,000 (Seyiti and Kelimu, 2021). A proposal put to the main gathering of Shandong provincial authorities in 2015 urged that donkeys be made eligible for the livestock subsidies already available for cattle and sheep, to no avail (Ma, 2022). In 2015 the China Animal Husbandry Association did establish a donkey husbandry branch. This set of circumstances had little impact on slowing the underlying donkey depletion dynamics, while the price of *ejiao* kept rising (Bennett and Pfuderer, 2020).

A December 2018 media report noted that the price of premium Dong'e Ejiao *ejiao* had risen 67-fold over 18 years and observed that this appreciation far outpaced even Beijing's second ring-road housing prices — which themselves rose nearly 15-fold over the same period (SinaFinance, 2018). The same source also reported Dong'e Ejiao's president had publicly declared a target price of 6,000 yuan per jin (500g), a level that would price premium *ejiao* at roughly 12,000 yuan (USD1600) per kilogram. A separate online commentary wrote that that the retail price rise from 50 RMB per 500g to over 2,000 RMB over a decade was a magnitude that even the property markets of Beijing, Shanghai, Guangzhou and Shenzhen had not matched (Lishi Business Review, 2016).

II.III Emergence of a China-Africa Donkey Hide Trade

As *ejiao* became more lucrative and donkey hides scarcer, a global sourcing quest emerged. Over the 2010s and often at the industry-level and not led officially, donkey-related trade agreements were rapidly concluded with nations as dispersed as Brazil, Australia, and Tanzania. Overall, Africa became the main locus: the continent is home to approximately 33 million donkeys, which equates to roughly two-thirds of the world total. Further, rural poverty, remoteness and porous borders foster liquidation-based asset sales, theft and smuggling. African hides are obtainable at approximately 12 percent of Chinese prices, hence offering profitable arbitrage (Zhihu, 2026).

Given the profit incentive in China, the value chain evolved quickly: local collectors acquired animals from agreed slaughterhouse quotas, liquidation-oriented subsistence households or through illicit slaughter; intermediary traders aggregated hides and transported them to abattoirs or border crossing points; exporters shipped to Chinese processors, including often packaged together with (other) illicitly traded animal and plant products. Inadequate donkey survey data, and the pervasive absence of certification, age verification, or ownership

documentation means there is no means in China to distinguish legally acquired animals from stolen ones, or breeding-age females from surplus males and elderly animals. Chinese import data record 1,339,730 unsplit whole equid skins imported in 2023, with approximately 59 percent sourced from African Union member states (Yicai, 2024). Such figures, alongside a later claim by Dong'e Ejiao that it has a donkey hide store of tens of millions of hides, are widely acknowledged to signal that the true scale of the trade, across porous borders, is much greater (Pope, Reeves, and Merks, 2022).

IV. An Elephantine “Market for Donkeys” ‘Tragedy of the Asses’

The Economic Theory of a Common Property Resource: The Fishery (Gordon, 1954)

foundationally argued that since common fisheries resources will be exploited until total revenue equals total cost no individual fisher is incentivised to protect overall fish supply, ultimately producing neither profit nor stock recovery. Hardin (1968) translated this into the popular pessimism of the tragedy of the commons. Clarke’s (1973) *The Economics of Overexploitation* and *Profit Maximization and the Extinction of Animal Species* showed that complete depletion of a species can rationally arise even among private owners of a resource like fish if the current period liquidation return is sufficient, noting that extinction liquidation is most probable for species that are both economically valuable and which have low reproductive capacities.

Norris (2021) estimates the natural donkey population growth rate sits at around 1%. By voluntary or involuntary asset liquidation, or more formal commercial sale, a study from 2019 by the Kenya Agricultural and Livestock Research Organisation (KALRO) estimated the annual mean rate of donkey slaughter in Kenya was 5.1% — five times the species' natural population growth rate. In this article, use of ‘tragedy of the asses’ draws from the environmental economics literature in a way as to also draw attention to the extraordinary set of conditions that exaggerate the uniquely adverse consequences and depletion mechanics along the entire donkey hide trade supply chain.

IV.I An Asset Liquidation Poverty Spiral

A caveat to this sub-section is that poor donkey survey population data, limited donkey theft data, and few if any estimates of the economic contribution of donkeys makes it especially

hard to trace the scale and impacts of the illicit donkey hide trade. The Donkey Sanctuary, a United Kingdom-based donkey welfare charity estimated in 2025 that some 5.9 million donkeys are slaughtered annually for *ejiao* production and that around 40% of African donkey owners surveyed have had animals stolen. Another data point suggested that one-third of hides arriving in China are from stolen donkeys, implying some 2 million donkeys are being stolen and killed for their skins annually (Deming, 2022). Further, is the element that the actual theft incident is itself traumatic too: stolen donkeys are typically violently slaughtered in, for example, an overnight raid, with body parts left nearby with horrified households being left to “beg for survival” (Bosibori, 2023). A case of secondary “deaths of despair” (Case and Deaton, 2020) in its own right. Moreover, where a donkey carcass is left near a village after its hide is removed it becomes a biosecurity risk.

In terms of voluntary sale, Clarke (1973) showed that for sufficient profit a rational resources asset holder will liquidate their stocks in the current period even if this leads to the species extinction. Dasgupta (1993) highlighted links between ecological depletion and poverty-related discounting. Using Tanzania as a case study Dercon (1996) set out a model of how poverty-induced liquidation of cattle induces a downward income spiral. The *ejiao*-linked donkey trade offers the same extinction outcome as Clarke (1973) but a depletion vector of theft and distress liquidation as in Dercon (1996). As in Dercon (1996), in the case of voluntary donkey liquidation there is a resulting socioeconomic downward spiral. In the case of donkeys versus cattle, however, the donkey household productivity-linked and with gender-asymmetric implications. Also, in the case of the donkey with greater scarcity and depletion consequences.

For example, a donkey in South Africa would fetch about \$30 at auction five years prior to 2022, but by 2022 cost about \$125 each (and in China a donkey hides would sell for some \$473 in 2017, by 2022 had risen to \$1,160) (AFP, 2022). One rural household in South Africa that lost multiple donkeys to theft noted that before the theft they were able to do six or seven loads [of transport work] a day – but now only two, because the (remaining) donkeys become too tired.” (Binda, 2019). A combination of donkey scarcity and price inflation combined with diminished household income and local economic context means that it is all but impossible for such households to replace the donkeys or substitute for them with machines.

With respect to the adverse impacts of the hide-linked trade on rural women and girls: a survey of donkey owners in Ghana reported numerous advantages enjoyed by women owning a donkey (Maggs, Ainslie and Bennet, 2023). Donkeys not only support income generation either directly via rent or sale (of foals for instance) or indirectly as a workhorse, but they bring a virtuous circle in that they carry elevated farm produce quantities at greater speed to market. Moreover, compared to the arduous labour and physical strain endured by women carrying goods on their heads, women with a donkey are like traders with mechanised transport. In other words, and as it was put at the first Pan-African Donkey Conference, efforts to save the donkey are essentially about preventing women becoming the ‘donkey’. For girls, meanwhile, where loss of a donkey reduces household income daughters are often kept home to help mothers with chores or even married off so the household can gain from a dowry (Pilling and Cocco, 2020). The Maggs, Ainslie and Bennett (2021) survey found that the donkey's contribution to women's time bank is approximately five hours of labour per week and for children ten hours.

In parallel to the profits made by a small number of legitimate slaughterhouses, an array of adverse household and community level welfare effects arise from the stock liquidation and theft-based donkey trade. At a household functioning level, the donkey's role in utility provision can be fundamental: the animal can carry heavier loads of water and heating wood alike (Maggs, Ainslie and Bennet, 2023). Moreover, approximately 70% of the IGAD region — encompassing Djibouti, Eritrea, Ethiopia, Kenya, Somalia, South Sudan, Sudan, and Uganda — is semi-arid, and some 50 million people therein rely on an estimated 20 million donkeys to fetch water, transport farm produce, and provide general mobility across terrain inaccessible to motorised vehicles (Sebsibe, 2022). Drought-affected areas across East Africa are forecast to expand by between 16 and 54%, with increasing frequency, duration, and intensity in Sudan, Tanzania, Somalia, and South Sudan especially (ibid).

The trade is a challenge to the Sustainable Development Goals of fostering climate change and economic resilience. Noteworthy also is that a donkey can be important beyond the owner's household. Fear of theft of donkeys is also found to reduce optimal donkey allocation within and between households — a behavioural dampening effect consistent with the insecurity-productivity literature (Justino, 2012).

IV.II Reversal of the “Market for Lemons” Asymmetry Accelerates Depletion and Poverty Spiral Effects

Along the main nodes of ejiao-linked donkey hide sourcing supply chain — seller (donkey owner, formal and informal), intermediary trader (legal and illicit) and *ejiao* producer buyer — there are an array of adverse selection dynamics that accelerate both related household and rural impoverishment and donkey depletion mechanisms. But, instead of the market collapsing as in Akerlof (1970), the inverse nature and incentives of an upside down “Lemons Market” means the market is incentivized toward depletion and rural economy impoverishment, in line with the mechanics of Kremer and Morcom (2000).

First, at the seller node, especially in the case of distressed sellers, there is little if any incentive at all to distinguish between hides based around donkey reproductive or working status. Equivalently, since it is male household heads who often liquidate donkeys, there is also disproportionate discounting of value of a working donkey to the family — as it is the female members of the household doing the ‘donkey’ work otherwise. The result is depletion-accelerating offtake of breeding-age females at rates disproportionate to their population-stock importance, and of productive working animals. A reported case of a multi-donkey theft in North-West Province, South Africa, for example, the bodies of which were found with body parts removed and evidence of a hammer blow to the head, with the owner noting that one slaughtered donkey was pregnant (Binda, 2019).

Given the contemporary value of a donkey in China, even a regulated private sector donkey industry player may rationally sell all their donkeys despite extinction risks (Clarke, 1973). Prior to the AU moratorium, which itself requires individual countries to change and enforce domestic laws to realise, China had signed formal donkey skin importation agreements with some sixteen African countries, detailed in Johnston (2025). The largest share of donkey-related exporting firms from those agreements are registered in Nigeria and Kenya. Agreed trade, has however, been challenging to regulate, directly and indirectly, and for example in the case of Tanzania, the relevant investors failed to meet breeding targets too (see Johnston, 2015). Moreover, regulatory intervention via quotas and national bans tended to displace rather than reduce trade. In the context of South Africa's export quota restrictions, for example, hides have circumvented these quotas via smuggling through Lesotho — a landlocked enclave with lower abattoir standards and no such quotas, and from where they are shipped to China (Johnston, 2023). Tanzania’s decision to host the inaugural Pan-African

Donkey Conference followed a long process of failed effort to establish a regulated and expansive donkey breeding and trade industry (see Johnston, 2025). In general, the sourcing chain is idiosyncratic, opportunistic, and irregular, brings cases of biosecurity hazards, and has links to illicit wildlife trade networks.

Finally, at the buyer node too since there is no means of for Donkeys”, the absence of hide tracing identification systems mean that there is no means for final hide buyers to identify the provenance of a hide. That is, whether it was acquired legally or illegally, and whether it was a breeding or working donkey, or bred as more traditional livestock. This produces a ‘pooled price’ between legally and illegally acquired, and depletion-spiraling and sustainably acquired hides. Where in the “Lemons” case a pooled price for used cars results in the unravelling of the market: quality car sellers withdraw, in the “Donkeys” the reverse happens. That is, instead of collapsing the market is fostered by a (lower than market) pooled price owing to asymmetric information about hide provenance. Both the intermediary trader and the buyer benefit from the overall lower donkey hide input cost drawn from pooling of (any) legally acquired hides with lower cost stolen hides, without any means of separating them. Lack of endogenization of stock depletion cost also supports a lower current price. Hence, in the absence of a credible quality signal, and just as the industry moved to sourcing abroad in the first instance, excess profits incentivize the market toward cheaper hide suppliers and hence ultimately toward stock depletion and rural household impoverishment.

For a basic comparison to Akerlof’s (1970) adverse selection mechanism let each hide be characterised by provenance type $\theta \in \{S, L\}$, where S denotes sustainably sourced (legal, non-breeding female, non-pregnant) and L denotes ‘lemons’ (stolen, distress-sold, breeding-age or pregnant female). Let $\lambda \in (0, 1)$ denote the share of lemon hides in the market, which is unobservable to the upstream buyer.

Costs

Let production costs be: $c_S > c_L$,

where c_S is the full cost of legitimate sourcing and c_L is the cost of lemon sourcing, with the gap $c_S - c_L$ reflecting the rent captured through theft, distress liquidation, and non-selective offtake.

Buyer's problem

The upstream buyer observes neither θ nor individual seller costs. The buyer's willingness to pay for a hide of unknown provenance is the expected value: $p = (1 - \lambda)v_S + \lambda v_L$

where v_S and v_L are the buyer's valuations of sustainable and lemon hides respectively. Since hides are physically indistinguishable at point of purchase:

$$v_S \approx v_L \equiv v \text{ so that: } p = v$$

regardless of λ . Unlike Akerlof's used car market, valuation does not depend on provenance because the buyer cannot use provenance in production decisions and faces no regulatory penalty for using lemon hides.

Seller participation

A sustainable supplier participates if: $p \geq c_S$

A lemon supplier participates if: $p \geq c_L$

Since $c_L < c_S$, the lemon supplier earns rent: $r_L = p - c_L = v - c_L > 0$

The sustainable supplier earns: $r_S = p - c_S = v - c_S$

which may be positive, zero, or negative depending on parameter values. If $v < c_S$, sustainable suppliers exit, $\lambda \rightarrow 1$, and the market is entirely supplied by 'lemon' hides — the full Akerlof collapse but running through the supply side rather than the demand side, and without any reduction in total trade volume. In other words, a market with even more need for credible quality signals than in the case of the "Lemons" market.

Hence, the core departure from Akerlof is that in the "Lemons" case the average quality of the pool deteriorates as good sellers exit, reducing p , and so driving further exit:

$$\uparrow \lambda \rightarrow \downarrow p \rightarrow \text{further exit of high-quality sellers}$$

In the donkey hide market, since hide is an input and since $v_S \approx v_L$, deterioration of pool (as compared to product) quality does not reduce p , leaving the consequences to be felt by stock depletion:

$$\uparrow \lambda \rightarrow \uparrow \text{non-selective offtake of breeding females} \rightarrow \downarrow B(x) \rightarrow \downarrow x$$

where $B(x)$ is the stock growth function equivalent from a Kremer-Morcom framework. In turn, the market does not collapse; it clears at $p = v$ with increasing λ , while the unpriced externality — population depletion, concentrated on breeding-age females — accumulates outside the price system entirely.

What corrects the donkey market, as in Akerlof (1970), is credible certification technology that makes θ observable at verification cost k . This splits the pooling equilibrium:

$$p_S = v_S - k \geq c_S$$

$$p_L = v_L$$

However, *ejiao* industry hide buyers should be willing to pay a “donkey sustainability” premium $p_S - p_L > 0$, which requires either that $v_S > v_L$ (buyers value sustainable provenance) or that regulatory penalties make v_L effectively lower by imposing a cost on illicit and unsustainably scaled purchases – regulatory penalties that also must be credible as Kremer and Morcom (2000) highlight. In the absence either of these conditions, $k > 0$ and the status quo of spiral toward stock depletion and rural household impoverishment remains.

IV.II The Donkey Market’s “Elephants” Depletion Mechanics Echo

In “Elephants” (Kremer and Morcom, 2000) open-access resources models are extended in a context of illicit wildlife trade to account for the unique ramifications of the relative storability of ivory. Specifically, anticipated future scarcity raises both current prices and hence poaching, and so creates an accelerating depletion dynamic. Government credibility, however, can move the outcome toward a sustainable equilibrium, but only if it is sufficient to enforce a poaching ban once populations shrink below a particular survival-linked threshold. A government move to restrict poaching that proves neither enforceable or otherwise lacks credibility will produce the opposite of its intent: it will incentivise accelerated near term poaching (in the presence of storability) and hence fosters elevated depletion given fear that an enforceable ban may be imminent and resulting price inflation. Kremer and Morcom (2000) argue that where government credibility is weak the cheapest

alternative is to accumulate a stockpile of ivory and threaten to flood the market, thereby suppressing prices and poaching returns.

Just as for ivory, donkey hides are storable for at least some months and *ejiao* for longer. At the time the AU moratorium was announced Dong'e Ejiao announced it had an inventory of 50-60 million hides and hence that it would be little immediately impacted.¹ What is different between “Elephants” and “Donkeys”, however, is that in “Elephants” harvesters are profit-seeking poachers of a commons-based wildlife. In the “donkeys” case, however, harvesters are instead a network of both formal and informal traders’ networks, stealing and distress-buying donkeys from private households, and a share of the broader trade is legal and a share illegal.

Kremer and Morcom’s (2000) conclusion that moratoriums without credibility foster accelerated depletion resonates with and draws attention to the donkey case. That is, across Africa regulation of donkey markets has in general been neither credible nor consistent — laws are enacted, reversed, or left unenforced, producing a patchwork of policy failure (Johnston, 2023 and 2025). Kenya illustrates the pattern well: the donkey trade was legalised in 2012, banned in February 2020, overturned by traders in court in May 2021, and banned again in August 2021. Today Kenya is considered a primary hub of the illicit donkey trade in East Africa, with domestic legislation poorly enforced and AU moratorium commitments largely unimplemented.

Attempts to establish a quota-based regulated trade — along the lines of fisheries models (Gordon, 1954; Clark, 1973) — have also floundered against the same forces: price incentives for slaughter, slow donkey reproduction rates, household distress-selling, and a deeply challenging regulatory environment. Tanzania offers a classic such case study, prompting it to host the inaugural Pan-African Donkey Conference in 2022 (Johnston, 2025). Indeed, in line with Kremer and Morcom (2000), and with Akerlof (1970), These are the circumstances that produced what is an exceptionally rare AU moratorium on all donkey slaughter and related trade.

The above fosters a spiral of impoverishment and stock depletion, and all else constant at rates faster than in each of Dercon (1996), Akerlof (1970) and Kremer and Morcom (2000).

¹ The industry is estimated to need anywhere from 3 to 8 million hides per year, although there are some caveats as to the optimal storage length of both hides and the array of different *ejiao* products.

Dercon's (1996) illumination of asset liquidation's poverty spiral consequences arguably apply more rapidly in the donkey market, owing to its informality, slower rate of reproduction, and the vital labour role that the donkey serves as a lower-income household capital asset. The argument holds more strongly in the case of liquidation by theft not sale. In the case of Akerlof (1970), the donkey market is the inverse of the "Lemons" market, and so the incomplete information asymmetry instead fosters the market's profit-seeker incentive toward a Clarke (1973) outcome. In the case of Kremer and Morcom (2000), a complexity of the donkey market versus the elephant market is attempts at a regulated trade that have ultimately been imperfectly regulated and emerged alongside a growing web of illicit trade. In turn, an inconsistent web of interventions and enforcement capacities has arguably even served to foster the accelerated depletion equilibrium sketched by Kremer and Morcom (2000).

That unique convergence of stock depletion and adverse household welfare spiral effects becomes the 'tragedy of the asses'. Let x denote the donkey population stock, p the hide price, and λ the share of lemon (stolen/distress) hides in the market.

Stock dynamics (from Clark 1973 and Kremer-Morcom 2000):

$$\dot{x} = B(x) - H(p, x)$$

where $B(x)$ is natural growth (low, ~1% per annum) and $H(p, x)$ is total offtake — rising in p and falling in x . As in Clark (1973), extinction is rational when the liquidation return exceeds the asset's present value as a working resource. As in Kremer-Morcom (2000), storability means anticipated future scarcity raises current p , accelerating H today — a self-reinforcing depletion spiral.

Price dynamics (from the inverted Akerlof mechanism): $p = v \forall \lambda \in [0,1]$

Unlike the standard lemons market, buyers cannot distinguish hide provenance so $v_S \approx v_L \equiv v$ and price is invariant to λ . Rising λ therefore does not collapse the market — it simply shifts the composition of offtake toward breeding females and stolen animals, loading the depletion cost entirely outside the price system:

$$\uparrow \lambda \Rightarrow \uparrow \text{non-selective offtake} \Rightarrow \downarrow B(x) \Rightarrow \downarrow x$$

Household welfare dynamics (from Dercon 1996): Let y_i be household income for a donkey-owning household. The donkey is a productive capital asset, so:

$$y_i = f(d_i, \mathbf{z}_i)$$

where d_i is the donkey endowment and $\mathbf{z}$ other inputs. Theft or distress sale reduces d_i , reducing y_i , which raises the household's discount rate ρ_i on remaining assets — inducing further liquidation at depressed prices:

$$\downarrow d_i \Rightarrow \downarrow y_i \Rightarrow \uparrow \rho_i \Rightarrow \text{further liquidation of } d_i$$

The Dercon spiral is sharper here than for cattle because: (i) donkeys reproduce more slowly, so replacement is costlier; (ii) donkey services are concentrated among women, so the welfare loss is gender-asymmetric; and (iii) the theft variant bypasses even the distress-sale price entirely.

The unified system

The three mechanisms interact as a reinforcing loop:

$$\uparrow p \xrightarrow{\text{K-M}} \uparrow H \xrightarrow{\text{Clark}} \downarrow x \xrightarrow{\text{Dercon}} \uparrow \lambda, \uparrow \rho_i \xrightarrow{\text{Akerlof-inverse}} \text{no market collapse, } p \text{ sustained} \rightarrow \uparrow p$$

In the standard commons or lemons case, at least one of these feedback channels self-corrects: prices fall as quality deteriorates (Akerlof), or harvest costs rise as stocks deplete (Gordon-Clark). Here neither correction fires. The inverted lemons mechanism holds p stable through depletion; slow reproduction and household poverty prevent stock recovery; and the absence of credible certification or enforcement means the externality — stock depletion and household impoverishment — remains entirely unpriced.

The tragedy of the asses is the modern *ejiao*-inspired market for donkeys in which depletion does not raise the cost of supply, poverty does not reduce the incentive to sell, and information asymmetry does not collapse demand — leaving no endogenous corrective mechanism and producing simultaneous species depletion and rural household

impoverishment at rates exceeding each model individually. And it arguably this set of circumstances that produced a remarkable and one-off case of de-globalisation from below.

V. Pain in Ass Markets Prompts — Bottom Up — Deglobalisation

Throughout history the ass has consistently held a symbolic role in marking human transcendence. Most classically, Apuleius's second-century *Metamorphoses* - *The Golden Ass*, in which the protagonist Lucius is transformed into a donkey and must endure a series of degradations before being restored to a — redeemed — human form. Biblically, in *Numbers* Balaam's working donkey perceives the divine while the human remains blindly misdirected, but after some beatings the donkey is ultimately able to re-direct its master. Where for centuries external extraction of African biodiversity and even mineral resources have little factored flora or fauna depletion or the socioeconomic costs, early in the 21st century the donkey, however, galvanised a stunning and rare united — deglobalisation — recasting.

V.I: The Pan-African Donkey Conference, December 2022

The inaugural Pan-African Donkey Conference (PADCo) was convened in Dar es Salaam in December 2022 under the theme "Donkeys in Africa Now and in the Future" (AU-IBAR, 2022). PADCo brought together a broad coalition of stakeholders including a sample of Ministers from across the continent, representatives from the African Union Inter-African Bureau of Animal Resources (AU-IBAR), the FAO, the International Livestock Research Institute, indigenous communities, animal welfare and veterinary scientists and activists, gender and child welfare experts, development economists, religious leaders, and African scholars of history and trade (Johnston, 2024; Goodrum et al., 2022). The agenda was “strategic planning, advocacy, and stakeholder engagement, AU-IBAR and its partners are paving the way towards a sustainable future where animal welfare is prioritised and protected.” (Interafrican Bureau for Animal Resources (AU-IBAR, 2024). The aim was a brighter future for both animals and humans alike in Africa. PADCo recommended a continent-wide fifteen-year moratorium on the donkey skin trade, reflecting a consensus that cross-border smuggling, inhumane slaughter, and population collapse had rendered the trade both socioeconomically damaging and scientifically unsustainable.

As compared to deglobalisation led by the incumbent power, the President of the United States, deglobalisation from below traces as being deeply inclusive and multilateral process. AU-IBAR on behalf of PADCo's organising committee methodically led the case through AU processes and channels, including winning endorsement at the Fifth Ordinary Session of the Specialised Technical Committee (STC) on Agriculture, Rural Development, Water and Environment in Addis Ababa in November 2023 (African Union Commission, 2023). Three months after the 37th AU Summit convened in Addis Ababa on 17-18 February 2024.

V.II AU Decision X.CL/1471(XLIV), February 2024

The 37th AU Summit was attended by representatives of 49 member states including 30 heads of state. Those representatives unanimously adopted to the recommendations of the Specialised Technical Committee (STC) on Agriculture, Rural Development, Water and Environment. That is, the February 2024 AU Summit historically adopted PADCo's recommendation of a fifteen-year moratorium on the slaughter of donkeys for their skins, aiming to protect donkeys and the communities that depend on them. Such moratoriums are rare. For example, there was another moratorium in 2006, on the Recognition of New Regional Economic Communities. This decision was made at the Banjul, Gambia, AU Summit, and was taken to rationalize the existing eight RECs, which are considered some of the core building blocks of African integration. The aim of this administrative expansion moratorium was to consolidate resources into the existing RECs.

The de-globalisation debate is rich in supply-side withdrawals characterised by trade policy reversals in large economies and reshoring of strategic industries, as well as weaponisation of strategic industries (Farrell and Newman, 2019; Baldwin, 2016). Rodrik's (2018) trilemma framework and its successors focus on the political economy of backlash in high-income democracies where the distributional losers from globalisation have sufficient electoral voice to force policy correction. In this case, the losers were members of the voiceless "Bottom Billion" alongside a species famous for its under-appreciated yet fundamental work. AU Decision X.CL/1471(XLIV) is, in contrast, a case of voluntary, unanimously officially endorsed, withdraw from commodity market integration initiated by a coalition of developing countries to protect a domestic productive asset from demand-side integration.

Far from a cross-country-produced high-tech product like a chip, AU Decision X.CL/1471(XLIV), in line with Kremer and Morcom (2000), seeks to suspend the global

commodity chains-linked depletion mechanism impacting donkey populations in Africa, and bring to an end the adverse welfare spiral that in turn brings rural communities in Africa. Far from a case of North-South distributional trade shock structure, and the potential to struggle to validate such defensive actions, in this case the poor in low- and middle-income countries are the concentrated losers from a Chinese-driven consumption shock with challenging regulatory arbitrage and implementation, and depletion mechanisms that are exaggerated by adverse selection and inconsistent implementation within and across borders. The AU Decision is intended to be the institutional vehicle for correcting those failures, and over a 15-year-period providing a window to replenish stocks along lines of (Kremer and Morcom, 2000).

V.III Response in China

An important caveat to this sub-section is that AU Decision X.CL/1471(XLIV) does not target China per se. It directly targets Africa's donkey populations, and indirectly the communities whose welfare is intertwined with the survival and work of the donkey. Nonetheless, implicitly it may be considered something of a rebuke of China. This sub-section broadly summarises Johnston (2026), and covers the media, official response and *ejiao* industry response.

The media widely reported the moratorium decision. Responses ranged from shock at a move of protectionism from Africa, being the Global South and not the West, to an honest reflection of Africa's socioeconomic need for its own donkeys (Qianyi Ejiao Jingsi Wuyuan, 2024). There was also questioning of *ejiao*'s efficacy. China's netizenry also expressed shocked, with some angry that a Chinese industry had been taking Africa's donkeys from the poor.

At the official level, meanwhile, there have been no direct responses. However, in April 2024, Shandong Province officially called for public comment on a host of suggested measures for advancing the quality and direction of the *ejiao* industry (Shandong Provincial Department of Industry and Information Technology, 2024). Otherwise, central Chinese authorities have issued a series of seemingly related announcements that emphasise reforming the industry's supply chains via elevated traceability initiatives and effort to raise donkey stocks. In parallel, authorities including the State Administration for TCM have launched information campaigns to ensure correct medicinal use of *ejiao*. Provincial and

local authorities have focused on the industry supply chain, and efforts such as a call for Shandong Donkey Industry Innovation Alliance, and the “Several Measures on Accelerating the High-Quality Development of the Ejiao Industry” of June 2024, which sets out the actual targets. In November 2025 the Shandong Provincial Animal Husbandry Veterinary Bureau held a seminar on the development of the donkey industry, with a related online post noting that the donkey had fallen by the wayside of modern agricultural science, and this necessitated an agro-industrial investment.

As if to signal its preparedness for future supply to shocks in light of the moratorium the industry’s dominant player, Dong’e Ejiao announced it had an inventory of 50-60 million hides, signalling both that China’s own donkey supply had diminished so rapidly or the scale of the illicit trade, and that the moratorium was not of immediate concern.² Nonetheless, news of the moratorium was followed by a jump in the domestic hide price as well as a new international quest to source hides. Central and South Asian nations, notably including Kyrgyzstan and Pakistan, have emerged as newly intensified *ejiao* supply chain-engaged nations since, with Pakistan agreeing to supply 216,000 donkey hides and meat annually.¹² In May 2026 the Brazilian state home to most of the nation’s donkeys imposed a ban on the trade.

Otherwise, and led by Dong’e Ejiao an alliance has been formed with China’s elite Agricultural University of China to foster more advanced breeding of donkeys, and sizeable investments have been made by Dong’e Ejiao in donkey breeding farms in places like Xinjiang Province too. Finally, and most recently it appears that Dong’e Ejiao is also investing in diversification, including into deer antler products, which also carry an ancient tradition in TCM.

V.IV China-Africa Nesting Context

An important point is that the AU moratorium did not emerge in a vacuum but in a long-run context of deepening China-Africa economic ties. China has been Africa’s largest bilateral trade partner since 2009, and bilateral trade reached a record USD348 billion, up 17.7% and

² The industry is estimated to need anywhere from 3 to 8 million hides per year, although there are some caveats as to the optimal storage length of both hides and the array of different *ejiao* products.

of which China's exports comprised USD225, according to China's customs data (WAM, 2026). This reflected growth of China's exports of 25.8% and imports of just 5.4% (ibid).

Seemingly in response to both concerns around the balance of trade and that the pattern reflects an earlier model of extraction, together with the new economic pressures faced by China as a result of geoeconomic tensions from the USA and Europe, China has elevated investment in fostering agricultural trade and development more broadly with Africa in particular, through a "Hunan Model", elaborated by Johnston (2026). Emphasis within the "Hunan Model" includes minerals and minerals processing, and renewables, which align with Hunan Province's agro-industrial strengths. In addition, the importance of agriculture to poverty alleviation, food security, and over time also to support China to diversify its external sources of food and animal feed. Indeed, the two sides in 2018 agreed the Changsha Declaration and the Hunan Model's agricultural cooperation framework (Johnston, 2026).

Even beyond the unique depletion mechanism context, in this greater political economy of development and contemporary deglobalisation pressures context and the importance of donkeys to rural communities in Africa, the actions of the *ejiao*'s industry's supply chains are truly bewildering. A trade that was systematically destroying the productive assets of the rural households China needed as future agricultural partners had become, arguably even from Beijing's own strategic perspective, counterproductive (Johnston, 2022, 2025). That the trade had emerged prior to the intensification of geoeconomic tensions between China and the USA may have made it more difficult to arrest via any mechanism available in Beijing, if any.

VII. The 'Tragedy of the Assess' Imperative Meets Nested Deglobalisation?

Autor, Dorn, and Hanson's (2013) foundational "China trade shock" documents a "China shock" as where rapid integration of Chinese manufacturing into global supply chains generates concentrated welfare losses among low-income workers, to adverse socioeconomic effect, (and ultimately political backlash). The case of the *ejiao* supply chain is not a story of social immobility and decline among blue-collar male manufacturing workers in high-income economies but a shock imposed upon some of the most marginalised rural women and girls

on earth — members of Collier's (2007) *Bottom Billion* whose presence barely features in GDP data let alone trade statistics. The welfare mechanism, moreover, does not operate through labour market displacement but through household and village-level asset depletion: the loss of a working animal that functions simultaneously as a capital good, a savings instrument, a time-poverty and health stress relief mechanism, and an intergenerational mobility enabler, for women especially.

Amid faded great power demographic tailwinds, geoeconomic tensions and supply chain contestation, the AU moratorium is a unique de-globalisation story and act of collective agency whereby 55 developing countries acted in unison to reshape the terms of a continent's integration into global commodity markets. It may even be the first what may one day be many trade-related standpoints taken by a continent united in trade under the African Continental Free Trade Agreement. The AU-IBAR more contemporarily and since the moratorium was announced, has framed the act not as one of de-globalisation but an act of global developmental: donkey conservation as not merely a matter of compassion but a strategic imperative for maintaining socioeconomic stability and ecological balance — one that requires a coordinated agenda of advocacy, stakeholder engagement, and resource mobilisation directed toward a sustainable future where animal welfare is prioritised and protected (AU-IBAR, 2025).

The AU-IBAR's successful campaign to realise Decision EX.CL/1471(XLIV) reflects many factors, including the importance of the donkey and the diplomatic dexterity of PADCo and its organisers. It also reflects a rare collision of top-down and bottom-up forces. Top-down context includes that Africa has become structurally more important in a context of major-power rivalries around access to critical mineral inputs for renewable energy supply chains, as a growth market, and as a site of geoeconomic competition between China, the United States, and others. It is possible that that recently elevated importance may have created a newly permissive environment — a nested deglobalisation opportunity — for an otherwise modest continental body to take an unprecedented step implicitly against its largest trade partner. Not least the element that the adverse impacts of the donkey skins trade themselves contradict overriding official China-Africa development narratives and were fostering bad will toward China at grassroots levels.

The bottom-up forces otherwise included convergence of the specific and devastating depletion mechanisms traced in this article. That is, the compound of slow donkey

reproduction, poverty-driven and gender-asymmetric asset liquidation, a reversed "Market for Lemons" dynamic that accelerates non-selective offtake of breeding females, theft and asset liquidation, and a patchwork of regulatory failure that, per Kremer and Morcom (2000), tends to accelerate rather than arrest depletion — and did so at the cost of some of the most economically vulnerable citizens on earth. The resulting ‘tragedy of the asses’ was sufficiently metamorphic to produce something genuinely rare in the annals of trade policy: a unanimous, continent-wide, voluntary withdrawal from a commodity supply chain. Moreover, in this case initiated not by a great power but by the voiceless end of the global income distribution, on behalf of a species famous precisely for its under-appreciated indispensability.

The AU donkey slaughter moratorium reminds too the deglobalisation literature has thus far concentrated on great-power and high-income country-led rivalries in trade and in reshoring of strategic industries (Farrell and Newman, 2019; Baldwin, 2016; Fajgelbaum et al., 2020; Amiti et al., 2019). It has, however, paid comparatively little attention to how those same geoeconomic pressures may concurrently reshape the strategic bandwidth of lower-income country coalitions, and how great-power-rivalry-induced elevated commodity-level depletion dynamics could ultimately produce their own deglobalisation impulses — from below. In an era of climate change and increasing rivalries and resources-based contestation, the "Market for Donkeys" perhaps not only provides a case study therein but perhaps sets a precedent also.

Adoption of Decision EX.CL/1471(XLIV) was a momentous milestone, but implementation is a different task entirely. An AU Heads of State political decision does not automatically translate into domestic law, and domestic law also does not automatically translate into enforcement. Under-resourcing of African regulatory capacity in the first place was a driver of the ‘tragedy of the asses’, implying that there is a risk that a new patchwork of legal changes across countries and time that are also inconsistently implemented produces yet more informal trade diversion and elevated trade too — the very regulatory arbitrage and trade-incentivising dynamic the Kremer–Morcom “Elephant” framework identifies as a depletion-spirally risk in a context of storable goods and imperfect government credibility.

What that means is that the pace of respective African government domestic implementation of Decision EX.CL/1471(XLIV) is therefore not itself administrative but probabilistically a critical determinant itself of whether the fifteen-year moratorium restores donkey populations

to viable levels – a sustainability equilibrium. The alternative is that it inadvertently accelerates depletion mechanisms. Based on discussions PADCo II, convened on 26–27 June 2025 in Abidjan, Côte d'Ivoire, under the theme "Africa's Commitment in Policy and Practice to Donkey Preservation Now and in the Future," the latter risk is non-trivial. Despite the event reaffirming the moratorium through the Abidjan Declaration, numerous speakers highlighted these broader regulatory and implementation risks and challenges.

VIII. Summary and Conclusions

This paper has examined a little-known and utterly neglected corner of the global economy: the market for donkeys. Not only is the donkey arguably the original factor-augmenting technology but its role in unlocking the Chinese end of the Silk Road makes it the original enabler of today's greater "China Shock".

This article has documented the rise of China's *ejiao* industry and China's ensuing and unusual U-shaped demand for donkeys. The ancient-turned-modern multi-billion-dollar industry's demand for five to six million hides per year today vastly exceeds global donkey reproduction rates, producing a dramatic and largely invisible China trade shock propagating through informal African donkey markets especially. The adverse consequences are being born by swathes of Collier's "Bottom Billion".

Three economic frameworks have been used here to explain the precarious dynamics of the market for donkeys. First, Clark (1973) and Dercon (1996) reveal the dynamics of a profit-driven and poverty-driven asset (stock) liquidation spiral. In the donkey case, the welfare losses are gender-asymmetric: women and girls bear the heaviest costs, yet distress-selling decisions are typically made by male household members. Second, a "Market for Donkeys" inversion of Akerlof's (1970) "Market for Lemons" reveals that because hide provenance is unobservable to upstream buyers, the market clears at a lower pooled price that subsidises "lemon" (eg stolen and unsustainable hide) sourcing, concentrates offtake on breeding-age females, and externalises depletion costs. Third, Kremer and Morcom (2000)'s storability angle is applied in the case of inconsistent regulation of donkey markets in Africa potentially risking accelerating rather than arresting depletion.

Where most of today's de-globalisation shocks are driven by great power rivalries and by political backlash of those in rich countries who bore the brunt of China's entrance to global

value chains, the shock of the AU Decision EX.CL/1471(XLIV): a unanimous, fifteen-year continent-wide moratorium on donkey slaughter, adopted at the 37th AU Summit in February 2024 – was a de-globalisation shock from below. That is, an act of South-South withdrawal from a commodity supply chain. It may only have been possibly for how it was nested into today's de-globalisation context, but this is not known. Regardless, implementation remains not only the critical challenge in that to the present it is unevenly enacted across member states. Further, a poorly implemented moratorium risks producing precisely the Kremer–Morcom perverse outcome of accelerated near-term depletion.

The donkey arguably is the original trade enabler. Like Balaam's donkey, it has offered rising China an unexpected intra-Global South medicinal 'shock'. Given the history of the donkey in and from Africa, its importance across swathes of the Global South still, Chinese authorities would be wise to re-direct its modern donkey-consuming industry, too. Moreover, in an era of intensifying global competition for resources and markets, it remains uncertain whether AU Decision EX.CL/1471(XLIV) will establish a lasting precedent or instead remain a one-off, "tragedy of the asses" context-specific act of solidarity. For China's *ejiao* industry it may be best not to test this fate. That is, to nobly improve its supply chains to ensure that all *ejiao* in China is 'donkey-safe', and to continue intensifying new investment in product diversification and donkey breeding science alike.

Future research directions are many and could include much greater study of the economics donkeys in the first instance. Visibility and accounting of their productivity may itself support the case to preserve the donkey and so foster improved regulation and diminished liquidation. Study of China's unique U-shaped donkey demand may also provide enlightening results, as may studies that trace China's response to AU Decision EX.CL/1471(XLIV). Pain in the ass markets, in terms of contemporary depletion mechanisms and donkey scarcity deserve more attention in the development economics and political economy of development literature alike.

For thousands of years the donkey has carried humanity's load, including across terrain that no other animal could cross. Ignored by economists, it is arguably the ultimate enabler of trade-based specialisation, globalisation and of the China trade shock itself. From Apuleius's *Metamorphosis* to AU Decision EX.CL/1471(XLIV) it has also served as a vehicle for transformational medicine in more ways than one. It appears that it may yet strike again. Ongoing research is warranted.

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